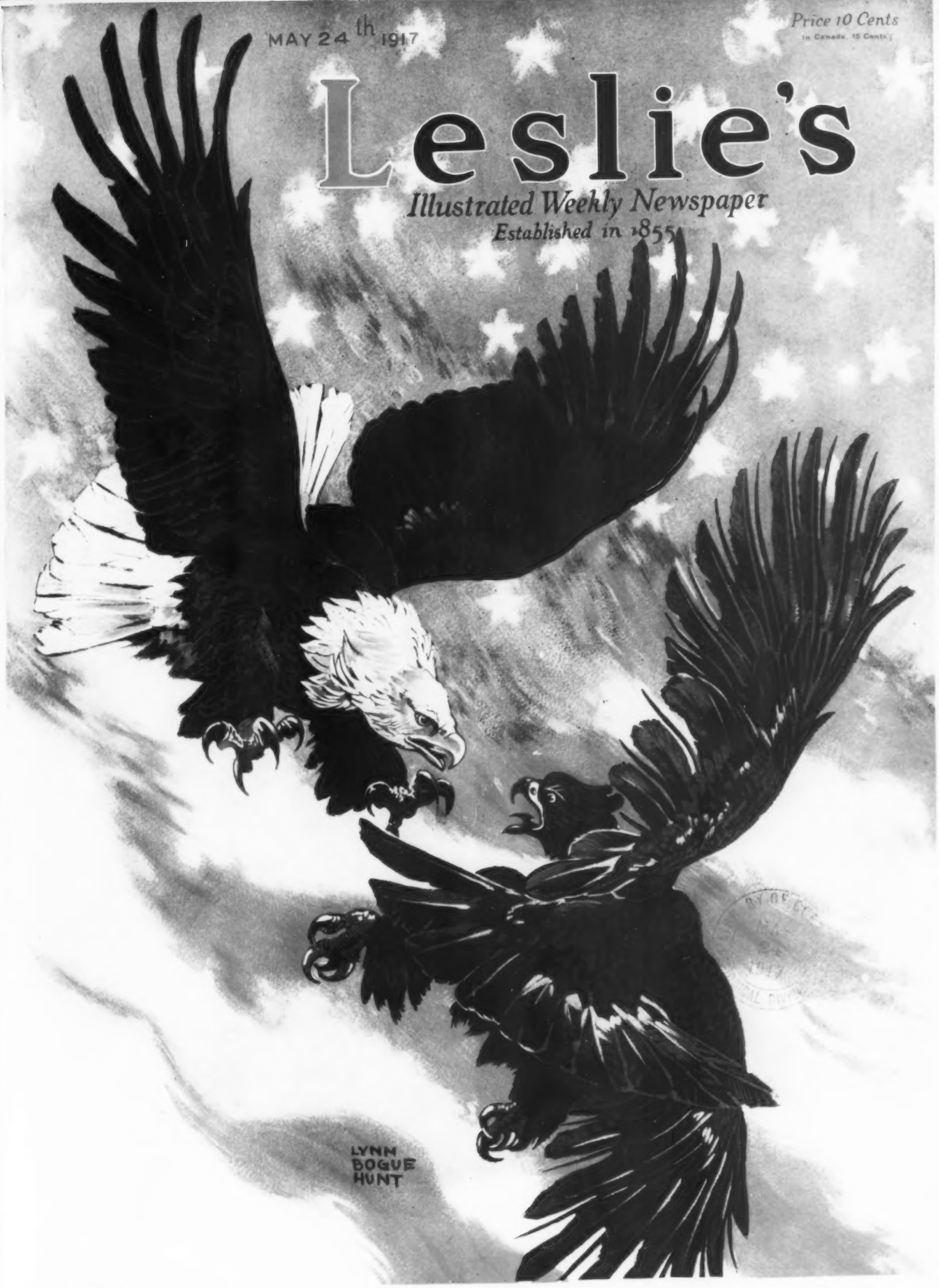


MAY 24<sup>th</sup> 1917

Price 10 Cents  
In Canada, 15 Cents

# Leslie's

*Illustrated Weekly Newspaper*  
Established in 1855



LYNN  
BOGUE  
HUNT

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By Leslie-Judge Co., New York

THE BLACK EAGLE'S MATCH

# TIMKEN DETROIT AXLES



## Up Hill or Down It's Double Duty for the Axle

Gathering headway on the level you take the up-grade with a running start—

And almost immediately *two tremendous forces attack the gears in your rear axle.*

All the way up to the summit, motor-power is *pulling ahead*, weight of car and passengers is *dragging back*. Coming down, it's the motor or the brakes that hold back, and gravity that pulls ahead.

*Six gear teeth must withstand the efforts of these conflicting forces to tear them apart or force them out of mesh.*

Six little teeth—three in the pinion and three in the big bevel gear! And while under that relentless stress, they must also take the sudden wrench, shock and pound of every rut and thank-you-ma'am.

But for your protection, Timken-Detroit Axle engineering insists, first of all, on *anticipating and providing for the extreme emergencies of hard service.*

Back in the factory, a companion gear to

the one in your axle—exactly like it in every detail, made of the same steel, fashioned by the same machines—was sacrificed to prove that *your gear would do its duty.*

That brother gear was locked in mesh between two pinion gears revolving in opposite directions with forces greater than the forces of motor and gravity on the steepest hills.

More and more power was turned on till the teeth of gear or pinion finally gave way—*far beyond the danger limit.*

Not that Timken-Detroit Gears are indestructible or that the full power of a high speed motor might not—*once in a million starts, perhaps*—break a tooth, for perfection is unattainable through human agency. *Nor has the steel-making art been able to attain absolute uniformity.*

*But the margin of safety provided by that gear test protects you on the hills or on the level. And you'll find it in every part and piece of Timken-Detroit front and rear axles.*

The inside facts about good axle construction are yours for the asking. Write for the Timken Primer, D-7, "On Axles." Sent free, postpaid, on request.



The smaller of these rear axle gears takes the power of the engine.

The larger one delivers that power to the rear wheels. The six teeth in mesh at any time must literally lift your car up over the hill against the resistance of gravity.



THE TIMKEN-DETROIT AXLE COMPANY  
Detroit, Michigan

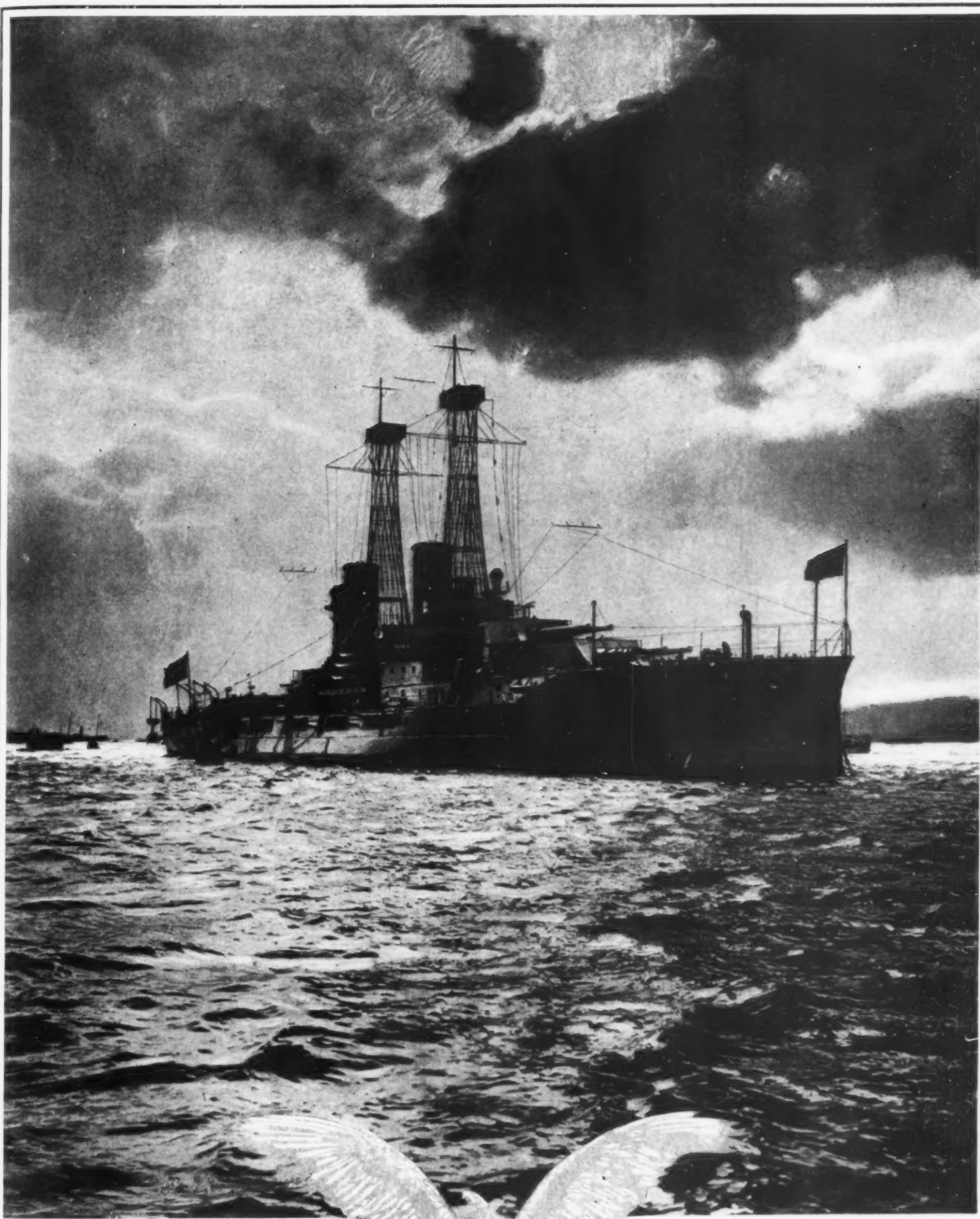




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May 24, 1917

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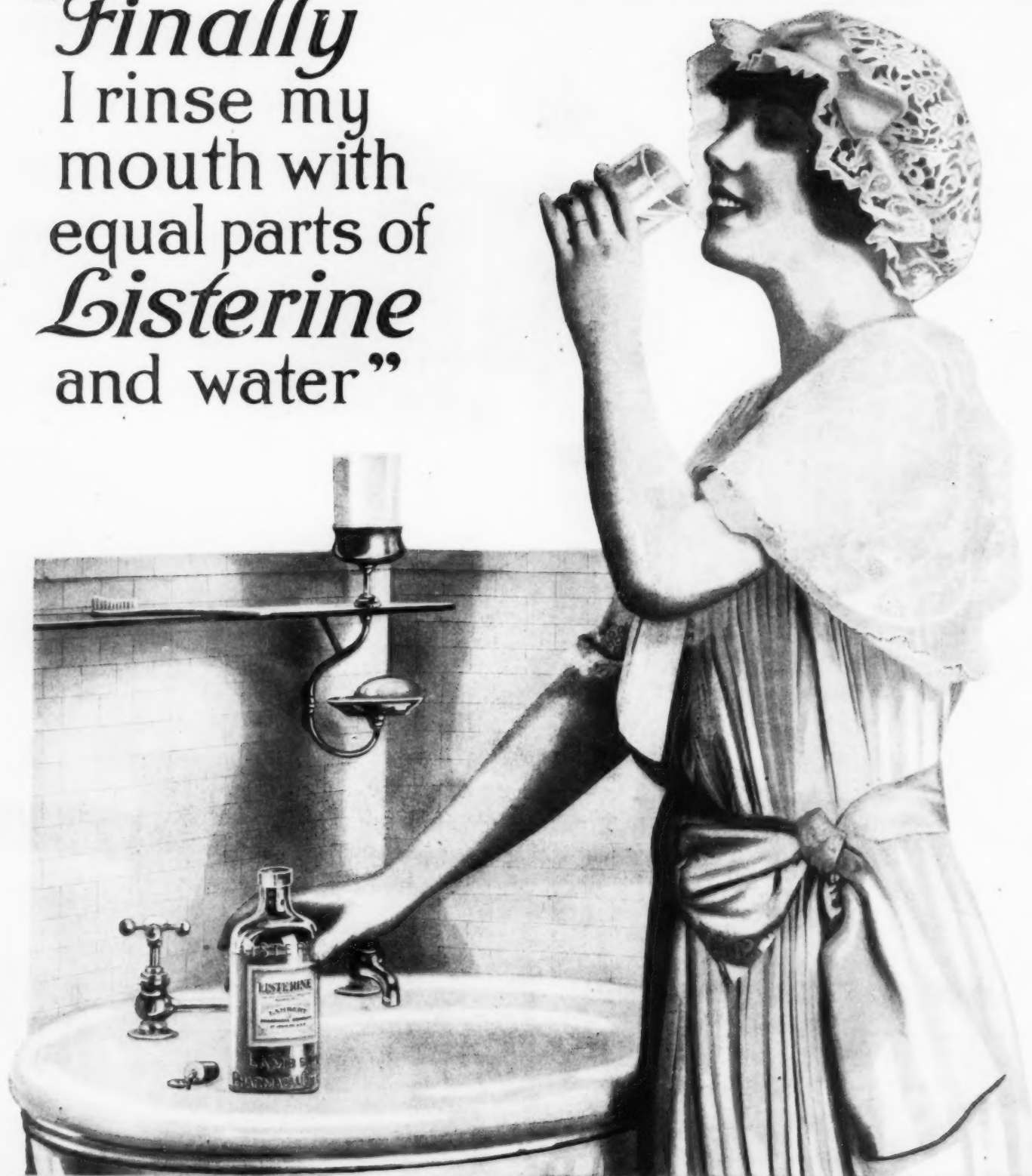


**BETWEEN THE LAND AND THE OPEN SEA**

Silhouetted against the evening sky, the *North Dakota* lies at anchor. The afterglow of the setting sun throws into bright relief the strong, yet graceful lines of the giant man-of-war. Behind it, as if under its

**A STRONG GUARDIAN OF THE NATION'S WELFARE**  
protection, the mainland stretches back to another ocean where sister ships keep their constant watch. Ships such as these are the backbone of the Navy, "the first line of defense."

*“Finally  
I rinse my  
mouth with  
equal parts of  
Listerine  
and water”*



**LISTERINE**  
**For Mouth Hygiene**

Lambert Pharmacal Co. St. Louis



# EDITORIAL

JOHN A. SLEICHER, EDITOR

## "FOR GOD'S SAKE, HURRY UP!"

Said the late Joseph H. Choate in asking America to take up the battle against Germany.

**M**ORE than forty-five days have passed since the United States declared war on Germany, yet the country is not aroused to the seriousness of the situation that confronts it. Americans do not realize that America is at war! No German soldiers are marching up our streets, no German cannon bombard our ports, no beat of hostile drum is heard, therefore our people are inclined to feel that the war is something distant and indistinct and its evil results remote. Many believe our entry into the struggle will mean the supplying of foods and munitions to our Allies, others look upon it as a profitable enterprise from a commercial standpoint. **Millions fail to recognize that this is not a play war but a conflict of life and death, that unless we put forth our best efforts and do so immediately, there is a possibility of its terminating disastrously to us.**

We have not felt how extremely important it is for us to act now, unitedly and patriotically, if we wish to avoid bearing the brunt of a war against a nation of trained soldiers. Unless we act quickly and resolutely the horrors of war may be brought direct to our shores. The conditions abroad are not as rosy as we have been led to believe. We have been lulled into a sense of security by the false impression that "all is well." The strict British censorship has told us the good things, but has kept from us a knowledge of how serious the true condition is.

Germany is not as near defeat as we have been told. She is not starved, nor is there a probability of starvation. Herbert C. Hoover, who has been in Belgium directing the distribution of food supplies and is thoroughly conversant with the condition of affairs in Germany, says that the Central Powers have enough food to enable them to carry on the war for two years longer.

Germany recognized from the beginning that this war was to be one of exhaustion. She also recognized that the English fleet would cut off her supplies from abroad, therefore, she planted every acre of tillable soil. She utilized her women, her old men, her children and her prisoners to produce provisions for her people. While the English blockade has been fairly successful so that little foodstuff has reached Germany from neutral countries, her supply, though short, is sufficient to last until the harvests, her autocratic government having limited the rations that the crisis may be bridged.

Germany has a sufficient amount of ammunition. The Krupp factories are in full swing. The threatened May Day strike, which was expected to cripple Germany, failed to materialize. While the condition of her manpower is serious because she has suffered greatly as a result of this war, Germany is not short of soldiers or workers. She has not reached her Apomattox. While there may be sporadic cases of discontent, her people are united. The militant power is in the ascendancy, and the government has a firm grasp of the situation.

On the other hand, what condition confronts our Allies? England is an island. She is not self-supporting, but is dependent for her food supply upon other countries. A large portion of England, virtually one-half, is not under cultivation, but is utilized by the aristocracy for hunting preserves. A large portion of Scotland is so mountainous as to be unproductive. The German submarines have so thoroughly blockaded England's ports that it is becoming increasingly difficult for her to secure the necessary provisions. We must face the fact that the submarine warfare is a success. The toll on foreign shipping was over 300,000 tons one week and over an extended period is enormous. This destruction will probably increase, as Germany is putting forth every effort in building new submarines. The trained officers and men of her idle navy transferred to the submarines furnish a limitless source for obtaining crews.

**The German submarine is sinking vessels faster than the world is building them. Eventually, unless checked, it will destroy English shipping, and England will be on the verge of starvation.** Lord Charles Beresford in a speech in the House of Parliament recently demanded that the people be told of the seriousness of the U-boat situation. England has devised no means of properly protecting her commerce from these "sharks of the sea." Hoover has said: "The food situation in Europe is one of extreme gravity. Every effort that we can make is required, and there can be no delay. The U-boat menace has increased alarmingly in the past weeks." The commissions from England and France have told us bluntly of the serious situation.

In Russia conditions are even worse than in England. There is no strong government. The present revolutionary party has not obtained full control of the situation.

The socialists are tired of war and in combination with the radicals may at any moment overthrow the present government. If they do, they will make peace with Germany. Then their vast territory will become a storehouse of supplies for the Prussians. **Even if Russia remains true to her alliance she is financially bankrupt, her people disorganized and her ammunition scarce. She can be of little active service to the Allies in her present condition.**

Italy has devoted her entire army to the recovery of the Italian provinces from Austria. She has taken no part in the general world conflict and in all probability will not do so.

France, glorious France, who has fought so nobly, is terribly weakened by the war. The country is crippled. The drain has been too much. A large portion of her territory has been devastated by the Germans. She has offered upon the altar of freedom her best manhood, and now, crippled and harassed, is appealing to America for aid. General Joffre, the hero of the Marne and idol of France, says that France needs our aid, that it is incumbent upon America to send troops abroad to lighten the burden that falls so heavily upon France's shoulders.

**At this crisis America steps in.** We have with true patriotism offered money to finance the war, but America must not stop here. Our Allies cannot eat gold. Letters of credit do not make bread; unless we can supply them with provisions, unless we can circumvent the U-boats, they will, Midas-like, be unable to spend for food the treasures of gold that we are prepared to lend them. This is a black picture but true. **Our Allies are in dire distress; unless we succor them, they will fail. If England starves, Russia revolts, and France crumbles, we alone will stand to face the enmity and anger of an aroused and vindictive Germany, and we are not prepared for this emergency.**

We believe in the patriotism of America. We believe that her sons are ready to die for her, are ready to spill the last drop of their blood, if only they realize the true state of affairs. Enlistments and enthusiasm have been light, not on account of lack of patriotism, but because we have not thoroughly appreciated the fact that it is urgently important that we act wholeheartedly and immediately to aid our Allies. We must send them soldiers and must send them as soon as possible. We must send provisions. We must build ships. We must train aviators. We must devise means of overcoming the submarine. We must cultivate every available acre of soil, so as to feed our Allies. We must economize—no wasting of food that will feed a soldier. A large amount of the foodstuffs that we send will be destroyed. The submarines will sink thousands of tons and we must send enough in excess of that which they destroy to provision our Allies. We must build ships rapidly enough so that hydra-like, two ships will arise to take the place of everyone that our ruthless enemy sends down. Our men must be trained. Our army officials are doing their best to awaken the people to this necessity. Colonel Roosevelt has thundered the message with a trumpet voice. Senator Lodge has preached it unceasingly.

Other statesmen and patriots have recognized our impending danger from the beginning, and others have completely failed to recognize it, but the crisis is now at hand. Americans must rise to meet the emergency. No true American will be a laggard when he knows that the very existence of his country is at stake. Our patriotism is not dead but dormant. It needs only to be awakened. Thoroughly aroused, properly trained and properly directed, America can stand against a hostile world.

**But, in the words of the late Hon. Joseph H. Choate spoken in the wisdom of his eighty-five years: For God's Sake Hurry Up!**



# The Exide

## Automobile Starting & Lighting Battery

**D**ON'T be content to take anyone's "say so" about the starting battery for your car. Get out your investigating glass and look them all over. You will not need the eye of an engineer to see why an "Exide" costs most to make but least to use.

Take as one instance its unit cell assembly (1), each cell a separate sealed unit. This makes it easy to remove a cell.

Its handles are sunk into the case (6) and permanently held there by anchors of solid metal; no bolts, screws or nuts are used in these handles.

The above are some of the salient features of the "Exide" Starting and Lighting Battery—it has others.

But, most important fact of all, it has built into it the knowledge, the experience and the ideals of the oldest and largest maker of storage batteries in this country, the company that for twenty-nine years has carried Quality Prestige throughout the storage battery world.

"There's an 'Exide' Battery for Every Car" and an "Exide" Service Station in every principal city

## THE ELECTRIC STORAGE BATTERY CO.

1888 PHILADELPHIA, PA. 1917

New York Boston Chicago Washington Denver San Francisco St. Louis Cleveland  
Atlanta Pittsburgh Minneapolis Detroit Rochester Kansas City Toronto

"Exide", "Nycap-Exide", "Tbine-Exide", "Ironclad-Exide", "Chloride Accumulator", "Tudor Accumulator"

*Batteries  
manufactured by this  
Company are used:*

In a majority of the  
U. S. Submarines

For Gun Firing and  
Wireless by the U. S.  
Navy

Almost exclusively by  
Large Central Light-  
ing and Power Com-  
panies

By the Telephone, Mar-  
coni Wireless and  
Western Union Com-  
panies

For Electric Vehicles,  
Mine Locomotives,  
Battery Street Cars,  
Railway Signals, Etc.

In thousands of House  
Lighting Plants

"Exide"



Copyright, 1916  
The Elect. Storage  
Battery Co.



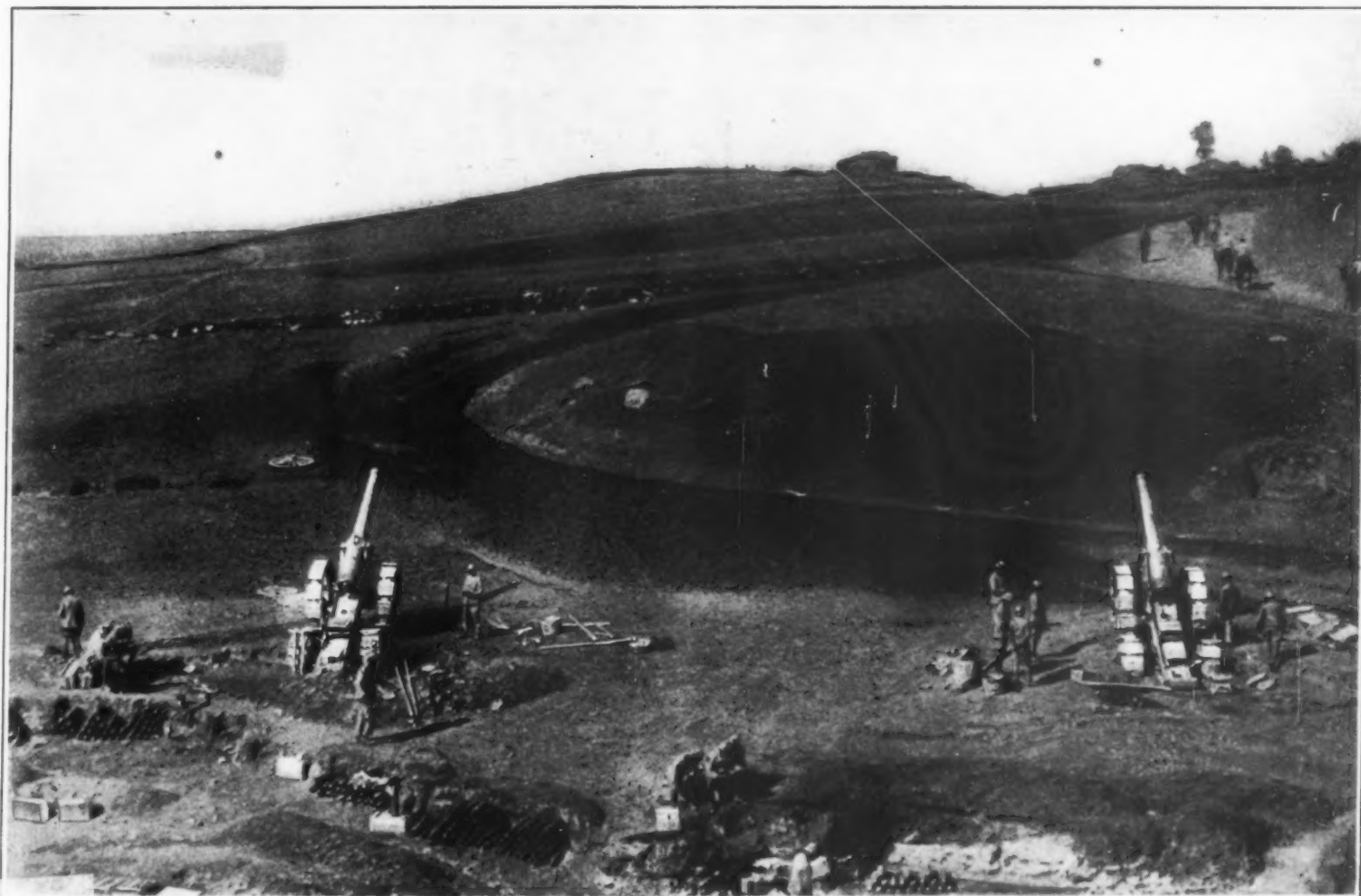
# THE WAR IN THE BALKANS



**ALLIES' SPRING DRIVE BRINGS HARD FIGHTING ON MACEDONIAN FRONT**

General Sarrail's expected offensive against the German-Austrian-Bulgarian front was launched early in May and won ground along the line held by the Serbians north of Monastir. Berlin announces that the fighting in this section is the most severe yet experienced on the Macedonian

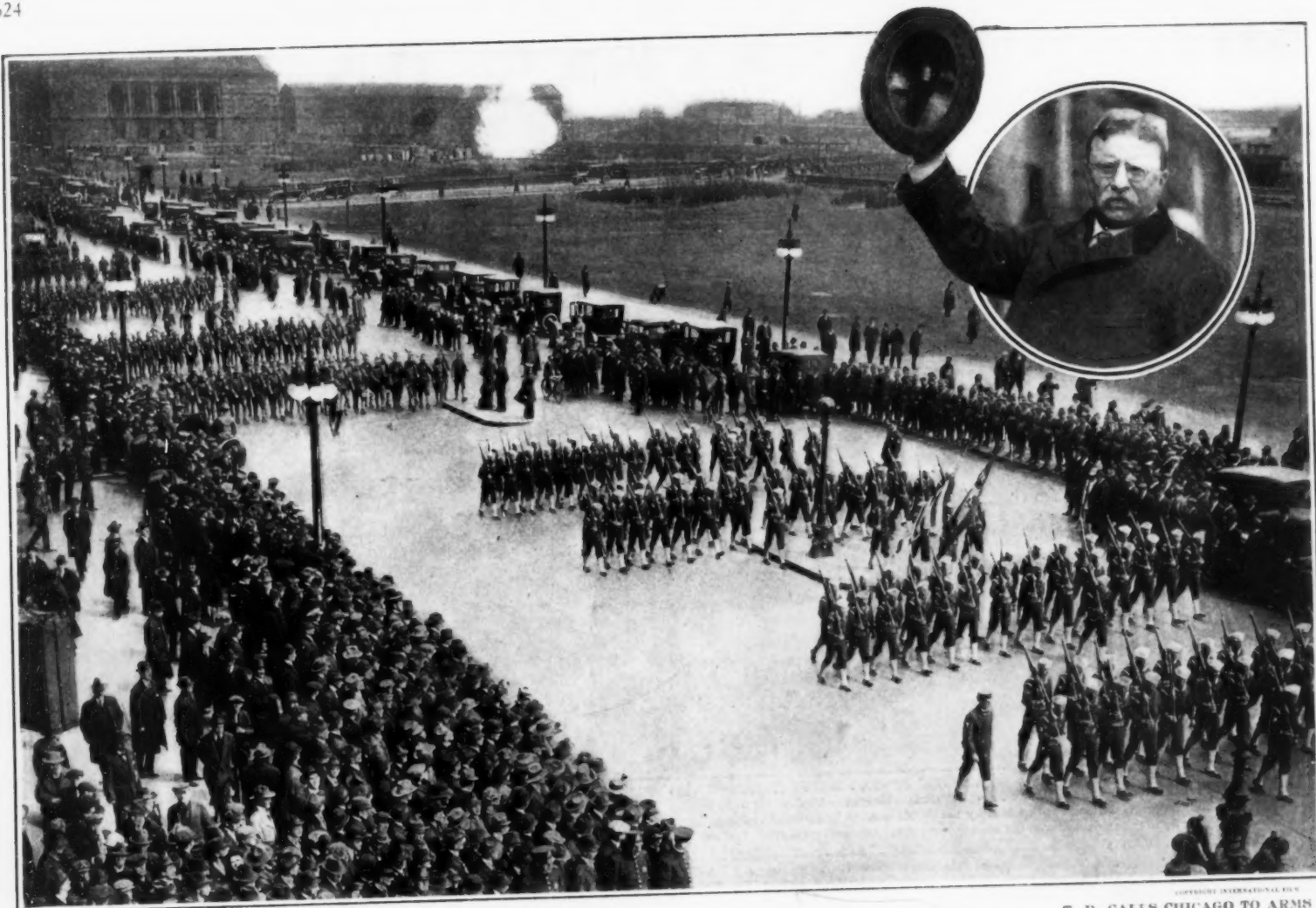
front and has been satisfactory to the Central Powers. Above are Serbian soldiers holding a temporary trench and breastwork made of field stone. Bulletins from the Serbian war office state that the Bulgars have bombarded Monastir with asphyxiating shells.



**HEAVY FIELD ARTILLERY IN THE OPEN**

These large guns extend across the plain north of Monastir and form the backbone of the Allies' offensive. The picture gives an excellent idea of the country held by the soldiers of England, France, Russia, Serbia and Italy. Opposed to the Allies are large numbers of Bulgar, German

and Austrian soldiers. General Sarrail has made his attack just at the time when German reinforcements are needed on the western front. The Bulgars are doing much of the fighting on this front, though weary of the struggle.



#### T. R. CALLS CHICAGO TO ARMS

In a speech of intense patriotism delivered before a vast audience, Colonel Theodore Roosevelt opened in Chicago, recently, his speaking tour in the President's support and in favor of sending American forces to the French front at once. Only incidentally did the Colonel mention the plan that now lies nearest his heart—a plan to lead, personally, the first American army in France. The Chicago audience applauded this suggestion as it did the Colonel's indirect criticism of Mayor Thompson's unpatriotic and inhospitable attitude in failing to invite the French Mission to Chicago until overridden by the city council's votes. Colonel Roosevelt was greatly pleased with his enthusiastic reception in Chicago and with the spirit he found there. The smaller picture shows him acknowledging the cheers of the crowd as he drove along Michigan Avenue. The larger picture shows sailors who formed one feature of the parade in the Colonel's honor. In the background is seen Grant Park and at the extreme left the Art Institute.



#### ITALIAN COMMISSION REACHES AMERICA

While New York was entertaining the members of the British and French Commissions several of the foremost men of Italy sailed into the harbor unheralded. There was no formal welcome, as the State Department had not been advised as to their date of arrival. The Commissioners, as shown in the picture from left to right, are: Alvise Bragadini of the transportation department; General Gugliemotti, military attaché; Enrico Arlotta, Minister of Transportation and head of the Commission; Commander Vannuletti of the navy; G. Pardo of the department of industry and commerce and Gaetano Pietra of the agricultural department. "The entrance of the United States into the war," said Minister Arlotta, "is looked upon in Italy with the greatest gratification, more especially because of the moral value of the act."



# PEOPLE TALKED ABOUT

## AMERICA'S NAVAL REPRESENTATIVE WITH THE ALLIES

Rear Admiral William S. Sims may be considered the guiding spirit of the Navy, for he is representing the United States at the naval conferences held in London and Paris and has control of operations in European waters. Admiral Sims has been given the same freedom of action by this country that has been extended by their respective governments to the British and French Commissions which have been visiting America. At the recent council at Paris Great Britain, France, Italy, Russia and the United States were represented by military and naval officers of the highest rank and it is believed that a comprehensive plan of operation for the American Navy was settled upon.



## AMERICA'S LEADING SCIENTIST

Dr. Charles Doolittle Walcott, for many years secretary of the Smithsonian Institution, has recently been elected president of the National Academy of Sciences, which is considered the highest honor this country can bestow upon a scientist. Dr. Walcott's scientific interests run from aviation to zoology, literally from A to Z. He is best known, however, as a geologist. Though he never attended college, Dr. Walcott holds ten collegiate degrees and is a doctor of science, philosophy and laws. He is shown in the picture in the Grand Canyon of the Colorado, his favorite spot in which to wield the geologist's hammer. At present much of Dr. Walcott's time is given up to the work of the National Advisory Committee for Aeronautics, of which he is a member. He is credited with having solved many difficult problems in aviation for the Army and Navy.



## A LAW TEACHER FOR SIXTY-ONE YEARS

Judge Nathan Green, though ninety years old, meets his boys at Cumberland University, Lebanon, Tennessee, five days a week and unravels the mysteries of the law as he has been unraveling them for three score years at the university. In the long lists of men who have spent their lives in teaching at college and university Judge Green ranks high. Among the pupils who have learned much of their law from Judge Green are such men as judges, governors and statesmen.



## HE RISKED HIS LIFE TO SAVE A ROBIN

Michael Ravolefe is a hero at twelve. He became one right in his home city one day as he was returning from school in East Hartford Connecticut. A robin which had used a long piece of twine in building its nest became entangled in the twine and fluttered for two days suspended in the air fifty feet above the street. When the bird's plight became known to Michael he volunteered to rescue it and, despite the danger, climbed the tree and released the captive. Persons who witnessed the feat said the boy showed great coolness and courage and in recognition of his act President William D. Love of the Connecticut Humane Society has written him a letter of thanks.



## APRIL 15TH IS A GREAT DAY FOR THIS FAMILY

On April 15th, 1861, when Horace P. Shoemaker responded to his country's call and enlisted in the army as a member of the 129th Indiana volunteers, he set a precedent to which his son and grandson have adhered rigidly. On April 15th, 1898, his son Clarence E. Shoemaker joined the 157th Indiana volunteers for service in the Spanish-American war. This year on the same date the third Shoemaker, Clarence L., enlisted in the Third Indiana regiment of the National Guard. From left to right in the pictures above are shown grandfather, son and grandson.

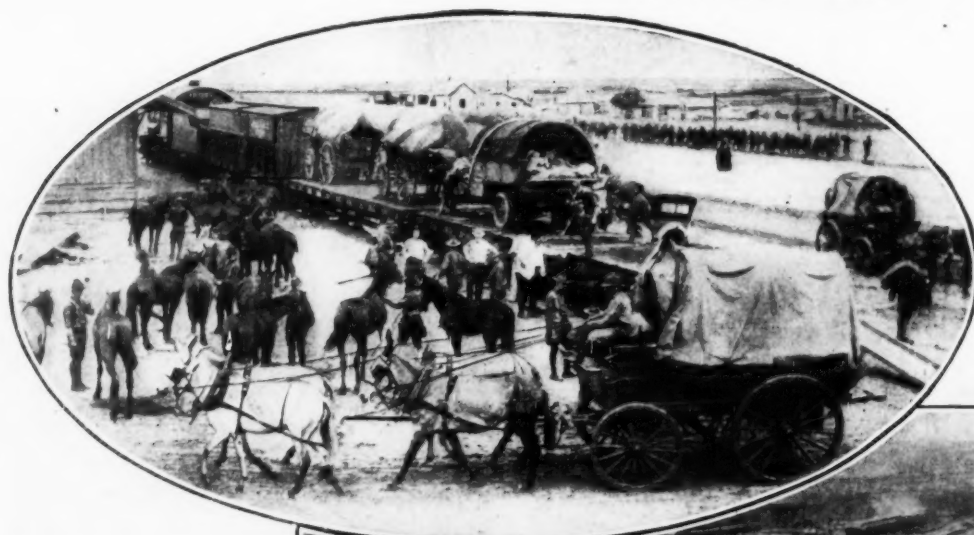


## CALIFORNIA HOLDS SHE RE-ELECTED PRESIDENT WILSON

When Long Beach, California, gave Wilson 6600 ballots instead of the normal 700 the State woke up to the work which had been done by Mrs. Nelly Hall Root, a woman of limited means, who turned the election through the distribution of propaganda and campaign work in favor of the re-election of the President. Mrs. Root in answering a letter from the editor of Leslie's writes that perhaps the bungalow in which she lives would hold more interest than her own picture, but we fear we must disagree. Mrs. Root's work for President Wilson was based on her "trust in his competency to deal wisely with domestic and international problems as a guardian of the hearth and highest interests of this democracy."

# WHEELS UNDER TWENTY ARMIES

BY GARRET SMITH



AMERICAN PHOTO ASSOCIATION  
ALONG THE LINE OF COMMUNICATION

The average person has little idea of the tremendous amount of material that the railroads of the country are called upon to handle when hundreds of thousands of soldiers must be maintained at the front. Here is a way station in the Mexican border country showing one regiment's baggage loaded on flat cars.

EDITOR'S NOTE—This article has been passed upon and approved by a high authority in the Quartermaster Department of the United States Army.

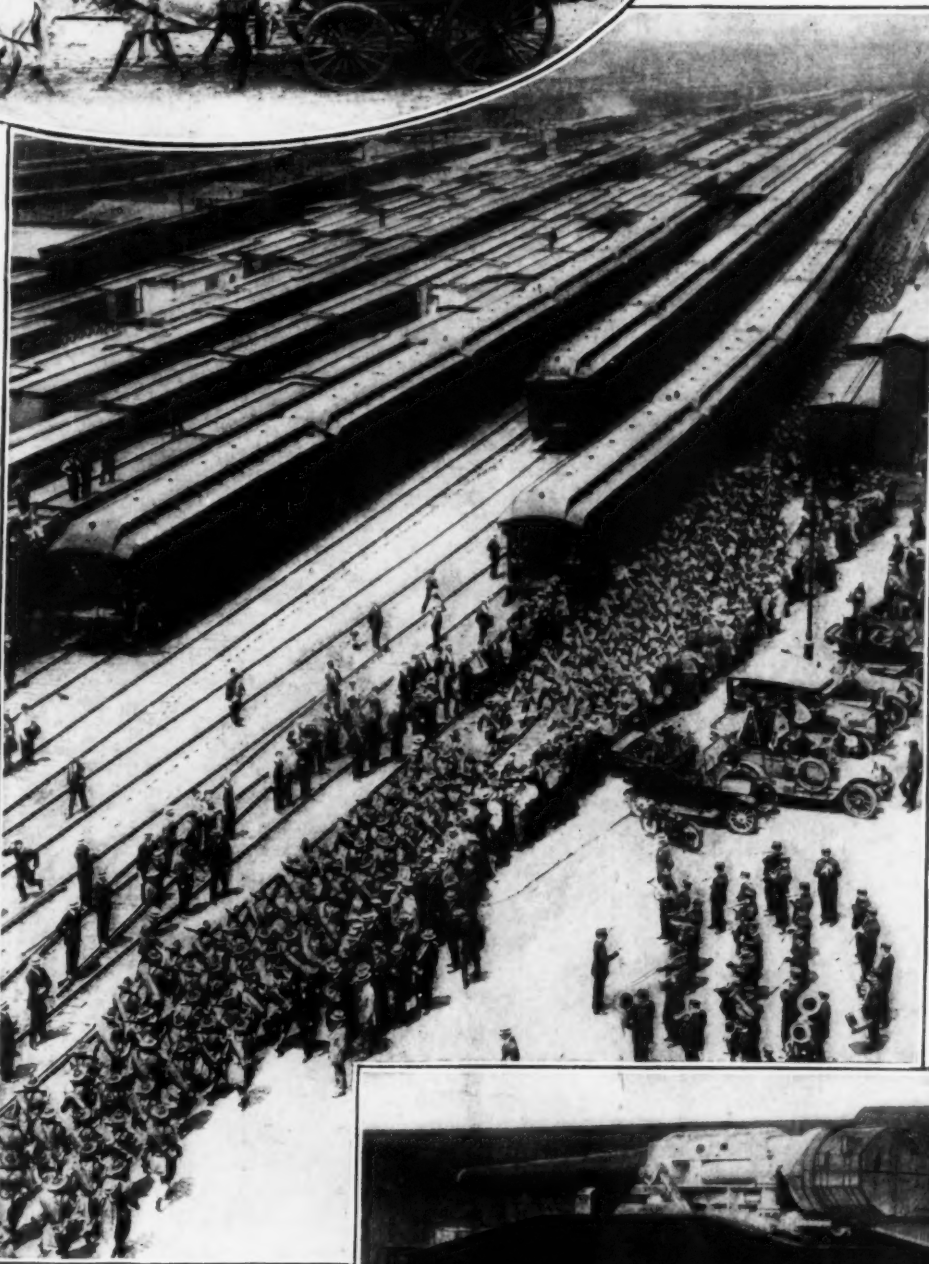
**T**HE Germans are landing on the coast of Delaware. Troops are being rushed there from every section of the country over every railroad line. All other traffic must be secondary to this one object. Delay at any point may be fatal to the country's safety.

"You have been assigned to equip and entrain a regiment at Buffalo and get it to the mobilization camp at Wilmington in the quickest possible time, without interfering with numerous other regiments bound for the same point. Start from the beginning and give us your whole procedure."

This hypothetical question was put to an applicant for a commission in the quartermaster corps of the U. S. Army recently. He was an office man with one of the big Eastern railroad companies. Railroad conditions over the route mentioned were familiar data in his every-day work. With the military technique of railroad-ing he had familiarized himself by a study of "Field Service Regulations" and other literature. He thought himself rather well prepared.

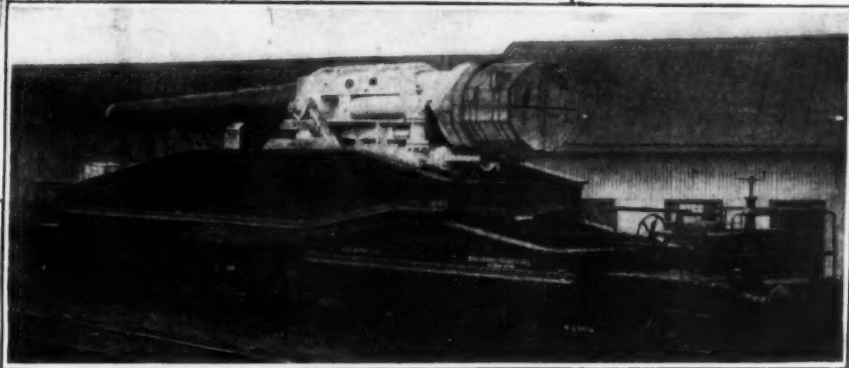
Yet he stumbled most unexpectedly before getting far with his answer. He had his regiment properly equipped, aboard train and well started. Then came the task of plotting the days' runs. As one of his stopping points he selected a little station that seemed to be most conveniently located on the map.

"Hold on!" commanded one of the examining officers. "Why do you stop there? Two other regiments from beyond Buffalo are following you. That is the junction point of the X—division, and three more regiments are coming up from the south. In other words, a whole division of troops is on its way to Wilmington over that route with yours in the lead. Down on the coast is a weak point in



AMERICAN PHOTO ASSOCIATION  
A RAILROAD TERMINAL IN WAR TIME

Exact knowledge, perfect organization and scrupulous regard of detail are absolutely essential in all transportation work or a war may easily be lost before a country's soldiers can be mobilized.



AN ARGUMENT AGAINST FORTIFICATIONS

Heavy guns mounted on special cars and easily transported for thousands of miles over railroads have done much to reduce the strength of forts which before the Great War were considered impregnable. The specially constructed car shown here has an electric motor attached.

our defense line that needs one more division to hold it.

"Don't you know?"—Here the officer paused, shook his finger at the candidate and then went on spacing his words impressively—"Don't—you—know—that—the—sid-ing—at—that—point—is—too—short—to—hold—a—troop—train? You don't? You stop there and before you get yourself untangled you've tied up that whole division of troops and delayed its arrival anywhere from one hour to a day. Meanwhile the Germans have broken the line and the country is invaded."

Without saying it in so many words the officer had indicated very graphically that so minutely complicated is the job of handling troops in big numbers, that lack of a thoroughly worked out system both in the quartermaster corps and the railroad offices might mean in emergency hundreds of such errors.

For example, some years ago a young lieutenant was in a railroad yard in a swamp a few miles north of Tampa, Florida, waiting for a supply train with emergency stores from the Frankford arsenal. Something had happened to the train. Finally he located it at a remote siding known as Turkey Creek, three weeks after it had left Philadelphia. The man from the quartermaster corps sent to help him in his search never found his own way down there at all.

Such incidents were many during the Civil and Spanish wars. In 1862 the Secretary of War was obliged to direct dishonorable dismissal of a number of officers for failing to load and unload cars promptly. These errors were comparatively few during the recent Mexican mobilization. Railroads and government have been working together for months now planning a unified system that it is hoped will make such mistakes in the present war practically impossible.

For next to an abundance of troops, ammunition and other military supplies, ample, well-regulated transportation is of first importance in war. Rail-

(Continued on page 643)



# MEN WHO ARE MAKING AMERICA

THE GREATEST INVENTIVE FIGURE OF THE AGE, THOMAS A. EDISON, WHOSE ACCOMPLISHMENTS HAVE GIVEN TO THE WORLD MORE THAN THOSE OF ANY OTHER MAN OF HIS GENERATION

EDITOR'S NOTE:—Thomas A. Edison is recognized as one of the greatest geniuses the world has ever produced. His story is told here by Mr. Forbes in an exceedingly interesting manner and at an opportune time.

BY B. C. FORBES

(COPYRIGHT, 1917, BY B. C. FORBES)

MANY think of inventors as geniuses who suddenly catch a brilliant idea from free air and patent it in workable form. Thomas Alva Edison is not of that type. He resents being called a genius or a wizard or a magician. "Genius is one per cent. inspiration and 99 per cent. perspiration," he declares. "The three great essentials to achieve anything worthwhile are, first, hard work; second, stick-to-itiveness; third, common sense."

Edison is acclaimed as the world's greatest inventor. After he had achieved success as an inventor and manufacturer, he dropped everything else and adopted invention for his life work, in 1876. After that he simply had to make good or become a laughing-stock. Edison made good. He is also the world's greatest experimenter. He tries thousands and thousands of ways to do a thing, and never quits until he has either found a way or proved to his satisfaction that it cannot be done.

Edison has worked harder and slept less than any other great man in history—he once worked continuously, without a moment's sleep, for five days and nights, while perfecting the phonograph. He has conducted more experiments than any other human being. He has taken out upwards of 100 patents in one year and has secured a grand total of over 1,000 patents, a record unapproached by any other individual in this country or abroad.

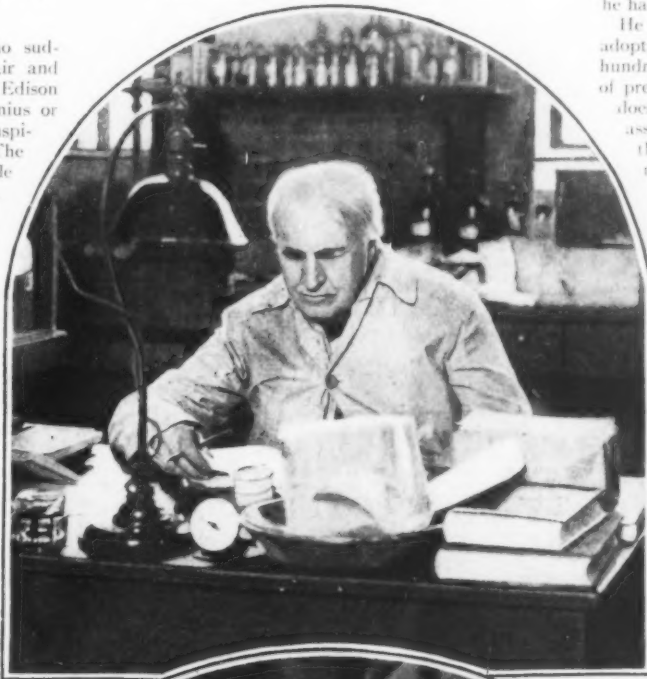
He has tasted the bitterest defeats and lost all his money time and again. He spent five solid years and over \$2,000,000 creating a plan and a plant to extract ores by magnets from powdered rock, only to find that the discovery of unlimited quantities of rich Mesaba ore rendered his whole process profitless and it had to be abandoned, leaving him grievously in debt but undaunted in spirit.

Difficulties which would drive normal mortals to despair only light up Edison's enthusiasm and stimulate his determination to triumph. If a thing won't work one way, he tries it another way—5,000 other ways, 10,000 other ways, 20,000 other ways, if necessary. He has sent botanists, mineralogists, chemists, geologists, and others into the most remote, uncivilized nooks of the earth in search of some fiber or other elusive material which the indefatigable experimenter calculated might prove the missing link in a chain of experiments—one expert circumscribed the globe in search of a species of bamboo which Edison figured might supply just the right filament for his in-the-making incandescent lamp, while other explorers combed the fastnesses of South America for a fiber which might still better serve the purpose.

With Edison inventing is the result of successful experimenting on definite lines. His greatest achievements have not been in originating ideas for new achievements, but in carrying to fruition what others have dreamed of accomplishing but failed to attain. Edison is a doer rather than a dreamer. He too, of course, has dreamed, but his fame rests less upon his dreams than upon what he has done.

He did not originate the telephone or the telephone; he was not the inventor of electric lighting; the electric railway was not first thought of by him; others had made moving pictures—of a kind; the recording of the human voice for reproduction was not an idea born in his brain; nor was he the first to think of storing electric energy in a battery.

But without Edison the world would not be enjoying these adjuncts of progress as it is today. His



THOMAS A. EDISON AT WORK IN HIS LABORATORY

Although now past the allotted span of three-score years and ten, Edison's brain has not lost its brilliancy nor his right hand its cunning. It is not yet time to write "Finis" to his career. "Don't you feel a sense of regret in being obliged to leave so many things uncompleted?" he was asked recently. "What's the use?" he replied. "One lifetime is too short and I am busy every day in proving essential parts of my established industries." These industries give employment and sustenance to an appreciable percentage of his fellow men and comfort, convenience, recreation, education to every civilized race, enriching the lives of all of us.

has been the master mind, his the master hand in bringing them to flower and fruition. Where others had failed, he has succeeded. Where others brought forth only ideas, he has created actualities.

He has a philosophy of failure which all of us might well adopt. If after thousands of attempts, the expenditure of hundreds of thousands of dollars and the apparent waste of precious years, he has only failure for his reward, he does not complain, he does not feel downcast. When his assistants commiserate with him and themselves on the futility of all their pains, Edison will cheerfully reprimand them thus: "Our work has not been in vain; our experiments have taught us a lot. We have added something to the total of human knowledge. We have demonstrated that it cannot be done. Isn't that something? Now let's take up the next thing."

That is Edison. Don't waste time and vitality bemoaning the past when the present and the future are calling so loudly to have great and small things accomplished. Look forward, not backward.

Not long since a minister asked a number of successful men, "What are the greatest safeguards against temptation?" Edison replied: "I have never had any experience in such matters. I have never had time, not even five minutes, to be tempted to do anything against the moral law, civil law or any law whatever. If I were to hazard a guess as to what young people should do to avoid temptation it would be to get a job and work at it so hard that temptation would not exist for them."

Edison literally works day and night. At crucial points in his career, when the invention, the manufacture or the installation of some contrivance has demanded every ounce of his energy and every moment of his time, he has not touched a bed for weeks and weeks, contenting himself with lying down for a brief spell on a floor with a book for a pillow or curled up on a roll top desk or stretched on a pile of metal pipes.

Inventors proverbially are eccentric. Edison is not an exception. He has not been inside a tailor's shop or had a tailor's tape applied to him in a quarter of a century! Some time before the close of the nineteenth century he was inveigled into allowing a tailor to measure him for a suit of clothes and every subsequent suit has been made from what he calls "that jig pattern!"

He is likely to appear at his laboratory in a light summer suit in the middle of winter. But he does not freeze to death, as Mrs. Edison has ingeniously contrived to supply him with three or four layers of underwear! Edison is reported to have received a foreign dignitary, delegated to cross the Atlantic and present Edison with a signal honor, almost stripped to the waist, his hands and face smeared with grime and grease—and it had taken supreme diplomacy and pressure on the part of his colleagues to persuade him to receive the visitor at all, so immersed was Edison in a vital experiment.

Last year, when a university conferred upon him the honorary degree of LL.D., it had to be done by telephone—he was too busy to go to accept the honor. One of the greatest universities in England announced that it would honor Edison, but he would not give up his work long enough to cross the ocean for the ceremony, and the proffered honor was withdrawn. Once he received a greatly-prized gold medal in New York and mislaid it on the ferry-boat on his way back to his Jersey home. "I have a couple of quarts more of them at home," he commented.

When France, at the Paris Centennial Exposition in 1889, made him a member of the Legion of Honor, at a memorable ceremony, Edison balked

(Continued on page 636)

# SOUTH AMERICA IN THE WAR

BY W. E. AUGHINBAUGH

**I**N view of the fact that several of the South American republics are on the verge of declaring war on Germany, the question that naturally comes to mind is, "How capable is Latin-America of really helping the Allies?"

In time of war, nations can aid those actively engaged by rendering direct military assistance, with troops or through their navies, by financial contributions; and by supplying such necessities as food, materials and munitions. Let us consider the countries to the south of us from these viewpoints.

From modern military standards I am safe in asserting that none of the Central or South American republics would be of aid to any of the belligerents. Instead they would be a positive hindrance. The armies of all the neighboring republics are, relatively speaking, poorly trained, badly equipped, and lacking in most of the essentials that go to make the ideal soldier. The Argentine, Chile, Peru, Bolivia, Uruguay and Brazil have conscription and many of the young men of these nationalities are willing and anxious to serve their country. They have military and naval schools wherein cadets receive training which entitles them to be commissioned as officers. But the rank and file are far from what men in the profession of arms should be, most of them being recruited from the lower classes and Indians, decidedly opposed to making sacrifices for their country. Furthermore, none of these lands has munition factories for manufacturing guns, ammunition or equipment, and all are dependent on Europe or the United States for their requirements. Their commissary departments and transportation facilities are positively archaic. Many of the armies are without medical officers or hospital corps.

Chile, Brazil and Argentina each have two modern battleships of the first class, with several small fairly up-to-date torpedo boat destroyers, which might, under certain circumstances, be serviceable. Each of these vessels is lacking in its complete complement of officers and crew. In fact, with the personnel provided they could not be properly maneuvered. The remaining fleets of Latin-America are obsolete. As with the armies of these lands, the naval equipment, arms and ammunition are supplied either by Europe or the United States, a serious handicap for efficient work. It is therefore quite apparent that no Latin-American nation is in a position to render military aid to the powers at war. It is only fair to these nations, however, to state that in the armies of France and England, as well as in the German forces, are to be found many Latin-Americans serving in various capacities.

Latin-American Republics have always been borrowers. Most of them have national debts far out of proportion to their revenues—in fact are to-day practically bankrupt. This is especially true of the Central American countries, Santo Domingo, Haiti, Ecuador, Paraguay, Colombia, Venezuela, Mexico and Peru. The enormous amounts of European moneys invested in their mines, railways, harbors, farms, and municipalities have been responsible for adding to their financial prostration because of the present war. Obviously help of a monetary nature need not be expected from these sources.

They can, however, be of material and practical aid through what their fields produce, through the output of their mines and through



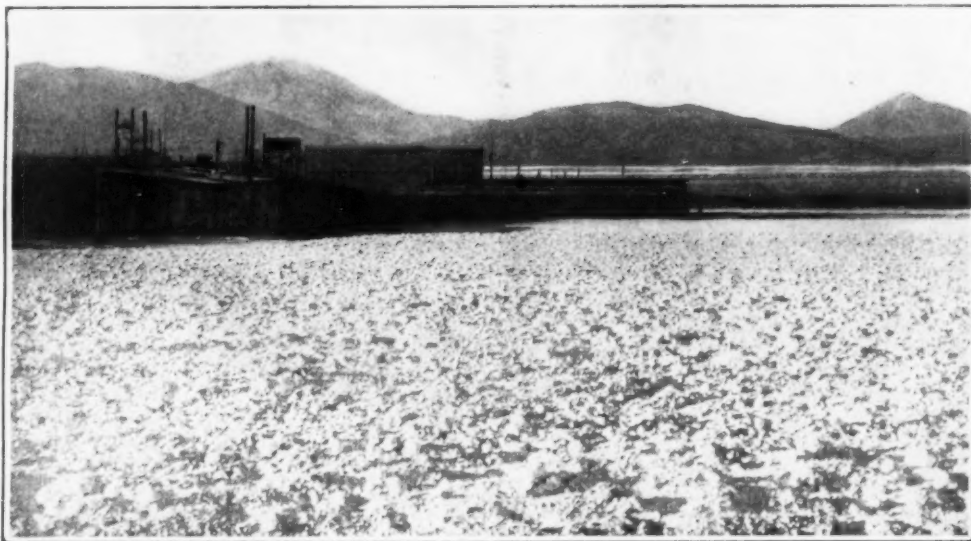
WOOL FOR THE ARMIES

A wool market in Uruguay, which perhaps is the leading wool market of today. Formerly no American buyers were present at the annual wool sale in the Argentine, Uruguay and Chile. Today American wool buyers appear at all these sales, and there is every indication that Boston will become the wool center of the world. Due to climatic conditions the wool from the sheep of the Argentine, Chile and Uruguay is exceptionally good and compares favorably with the best wool in the world.



BEEF FOR THE WORLD

A herd of cattle on the Argentine pampas. The pampas are level tracts of ground, well watered and capable of supporting millions of head of cattle and sheep. The tracts are also the home of the emu, a bird very much resembling the ostrich. Passengers in the trains crossing the Argentine Republic very often see these birds along the route. To give some idea of the vastness of the pampas and how very level they are, one of the railways in the Argentine runs for a distance of 312 miles in a straight line, without a curve or an elevation or depression in the roadbed.



THE EARTH'S GREATEST NITRATE FIELDS

This shows a nitrate field and one of the nitrate oficinas or refining plants in Chile. It is estimated that the nitrate fields of Chile are capable of supplying the world with this necessity for two hundred years. These nitrate fields were

once the bottom of an ocean, and due to some titanic upheaval the water receded and the sun dried what had been the ocean bed. A more desolate place cannot be imagined. There is no vegetation, and water has to be imported.

their vast petroleum fields. The wheat fields of Uruguay and the Argentine, prior to this war, exported the greater percentage of their flour to Europe. This was equally true of the meat-packing establishments, and since the beginning of hostilities Brazil and Paraguay have become great exporters of cattle products. Venezuela and Colombia, as well as Nicaragua, could add to the meat supply of the Allies if they would, for they have the cattle and many modern abattoirs within their territory. Sugar for food purposes and its by-product alcohol, now largely used in modern explosives, could be contributed in monstrous quantities by Cuba, Santo Domingo, Haiti, Venezuela, Colombia, Peru, Brazil, and the Argentine. Brazil alone can supply the world with coffee, but Mexico, Guatemala, Colombia and Venezuela also are large exporters of this staple. Cocoa and chocolate, perhaps more stimulating and certainly richer in fat than coffee, grow abundantly in Ecuador, Bolivia, Venezuela, Santo Domingo, Haiti and Colombia. The crop this year in Ecuador promises to be a bumper one.

Most of our crude drugs come from Latin-America. Peru and Bolivia yield quinine, cocaine, bismuth, borax, sassafras, nuxvomica, while rubber for surgical purposes and hospital supplies is to be had from Brazil, Bolivia, Venezuela, Peru, and many other nearby localities.

Wool from the sheep of Chile, Bolivia, Peru, the Argentine, and Uruguay might be made into clothes for the soldiers, while the hides of the millions of cattle yearly slaughtered in these lands could be converted into harness for animals and shoes and accoutrements for men.

The vast oil fields of Tampico, Mexico; at Lobitos, Peru, and in the interior of Bolivia, where pipe lines are bringing the supply into the Argentine Republic, could contribute larger quantities for fuel for ships, and for the production of gasoline for motors.

Brazil is to-day one of the biggest producers of cotton goods in the world and her plants could be made to donate a larger proportion of this necessity. Peru also has several good sized mills manufacturing excellent fabrics from home grown cotton.

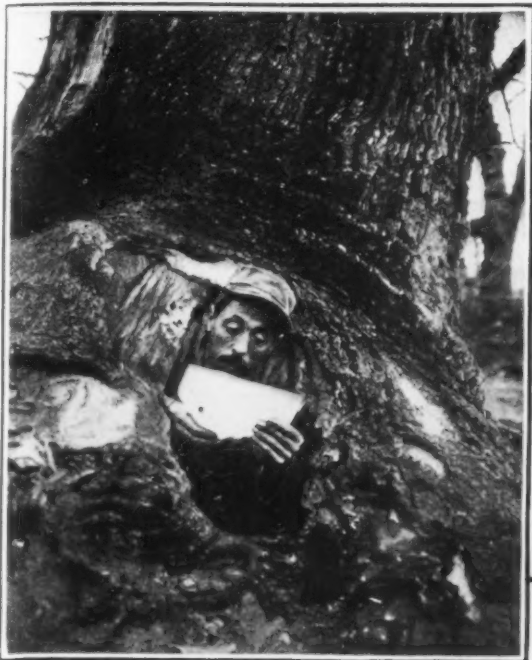
Chile, Cuba, Mexico, Venezuela, Peru and Bolivia have enormous deposits of high-grade iron; the copper of Chile and Peru are famous the world over; Bolivia is the mineral treasure house of the world, her mines being rich in tin, antimony, zinc, wolfram, gold, silver and other minerals. Mexico and Venezuela have large sulphur deposits. Chile leads the world in the production of nitrate, used in the arts,

as a fertilizer and for gunpowder and high explosives.

And from Cuba, Mexico, Brazil, Peru, Venezuela, Santo Domingo, Haiti, and the Central American Republics comes the one thing so dear to the heart of every sailor and soldier and as necessary to their contentment as food and raiment—tobacco.

It should be borne in mind that in nearly all of these lands German interests are dominant, and it may be necessary to use diplomacy of the highest quality to secure the co-operation of our sister republics in this war for democracy. As typifying the strength of the Teuton in these lands it may be well to recall that a fortnight ago both the Argentine and Brazil were on the verge of war with Germany. But the strength of the German merchant became evident when it was announced that Germany had made satisfactory explanations and promises to these Latin-American republics.





## BEHIND THE LINES OF OUR ALLIES

### THE ANCIENT AND HONORABLE ARTILLERY HORSE

The army horse, its patience and reliability, all are familiar. This caravan is bringing to the fighting line a supply of ammunition. Across each animal's back are hung ammunition bags and each horse's load is eight shells, beside canteens and other needed things. Since the Germans in their retreat destroy all roads, the supplying of the troops falls upon horses and mules until motors and trains can again be used.

SPORT AND GENERAL PHOTO



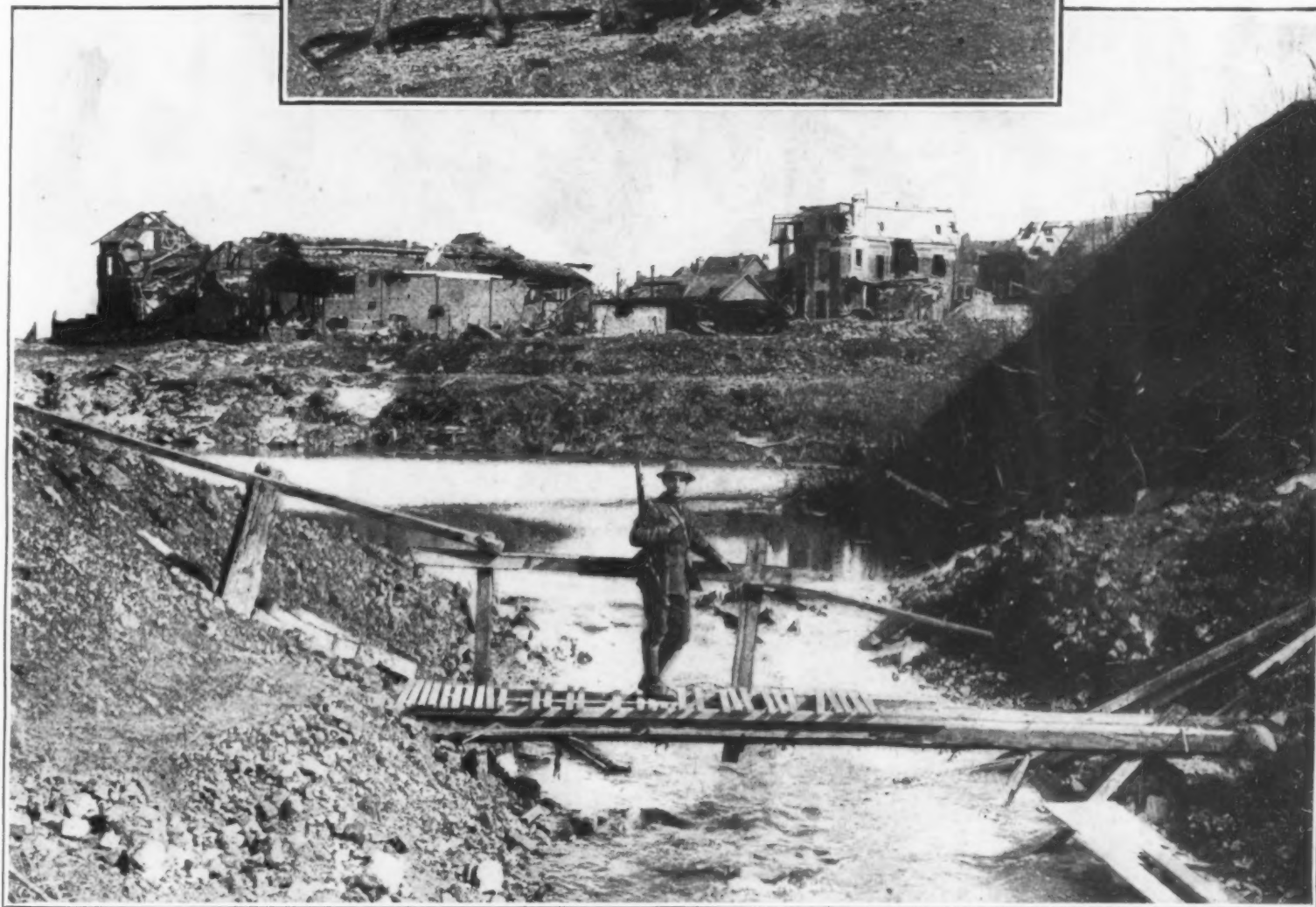
### SQUIRREL OR POILU?

Nature provided a snug retreat for this French soldier. A hole in the base of a hollow tree is his small but cozy home, warm, dry and safe—or as safe as anything can be on the battle front. Here he is reading his mail. The ingenuity of soldiers in making trench life bearable has been attested by many photographs of unique devices, invented in necessity, as substitutes for the conveniences of home.



### DETECTING MINE OPERATIONS

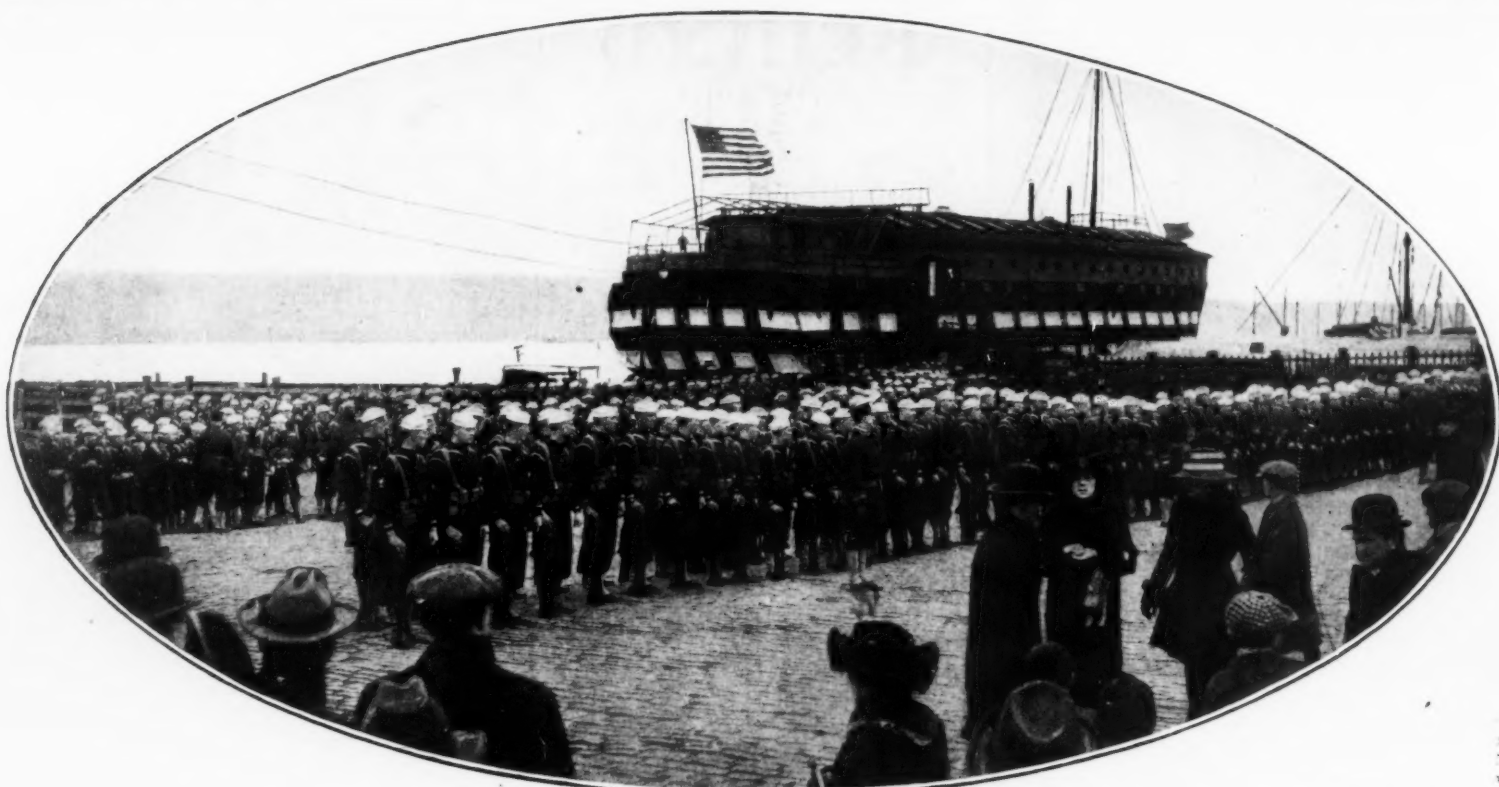
The delicate instrument which this French officer of the engineering corps is using is a microphone, which will detect the faintest sounds. With it, activities in the ground, within a wide range, are reproduced. It is possible to hear hostile mining parties digging, and to know how far their work has progressed. When the sounds stop the listener knows the mine has been planted and gives the alarm.



### ONLY DESOLATION AND RUINS IN THE WAKE OF THE RETREATING GERMANS

Devastated villages, burned bridges, and streets and roads made impassable by the barricades of ruined homes mark the route of the northward retreat of the German forces. One of the late important losses of the Germans was the city of Craonne, which fell before General Nivelle's poilus.

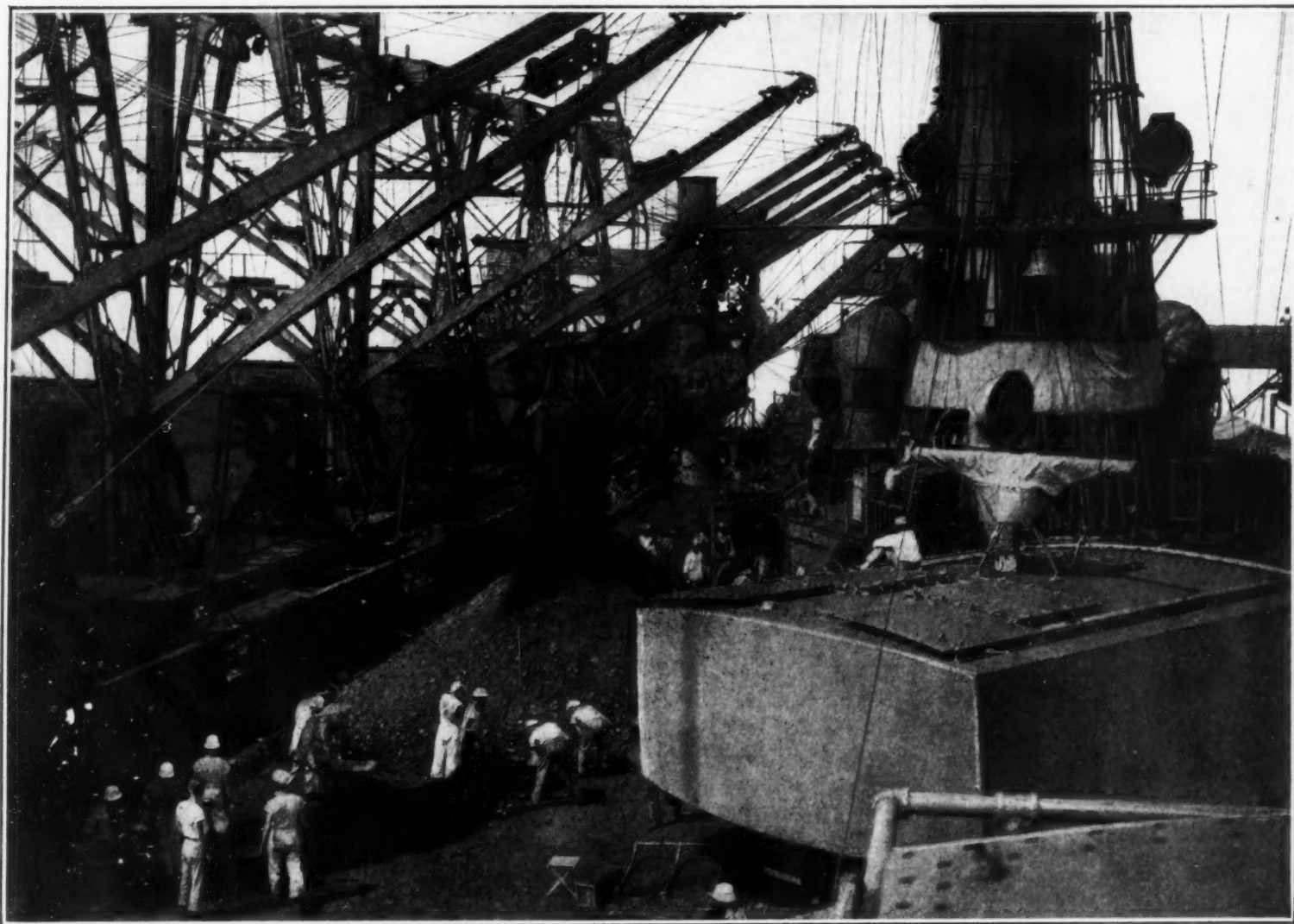
The city was a vital point in the Hindenburg line and its fall seems to presage a German retreat toward the Franco-Belgian frontier. While the French are advancing from the south, the drive of the British continues and the Teutons are being pressed back upon the territory they have held so long.



#### MEN OF THE NAVAL MILITIA PREPARE FOR SERVICE

One of the most popular branches of military or naval service is the Naval Militia, which, under State supervision and Federal authorization, trains men for naval service. Enlistment, ordinarily for three years, at present is for the duration of the war. The Naval Militia is an

auxiliary to the Navy. At present the Naval Militiamen are in the Federal service and are supplementing on ship and on shore the work of the blue-jackets. This photograph was taken the day the Militia mobilized, on the dock alongside the training ship *Granite State*, at New York.



#### A BIG JOB AND A DIRTY ONE, BUT IT MUST BE DONE

It is no small task to fill the coal bunkers of a man-of-war: the derricks dump the coal from the collier in piles on the decks of the battleship, and the jackies wheel the coal in barrows to the

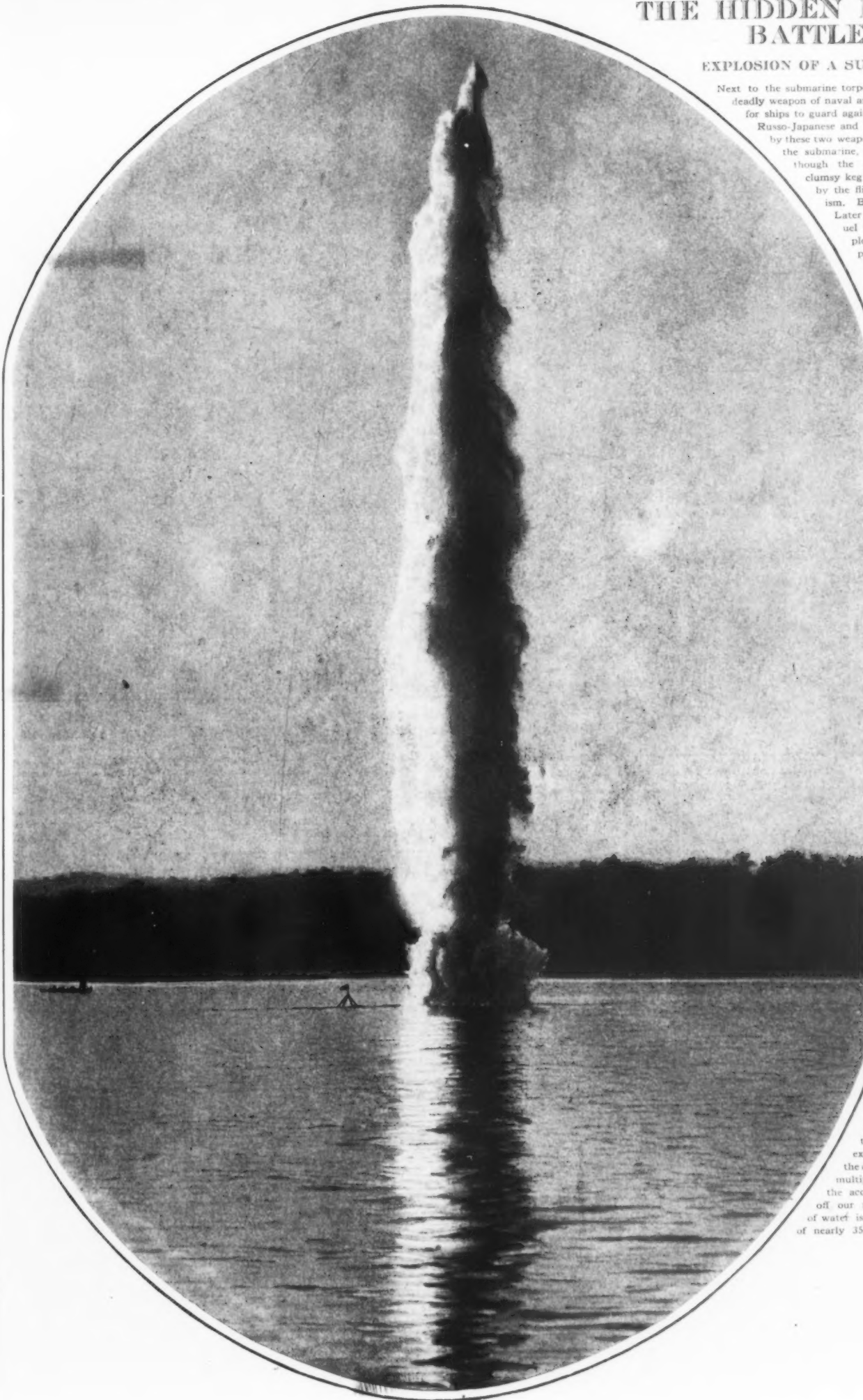
chutes. But every man does his share and the task is not long. The new types of battleships are oil-burning and the work of supplying them with fuel is short and comparatively clean.



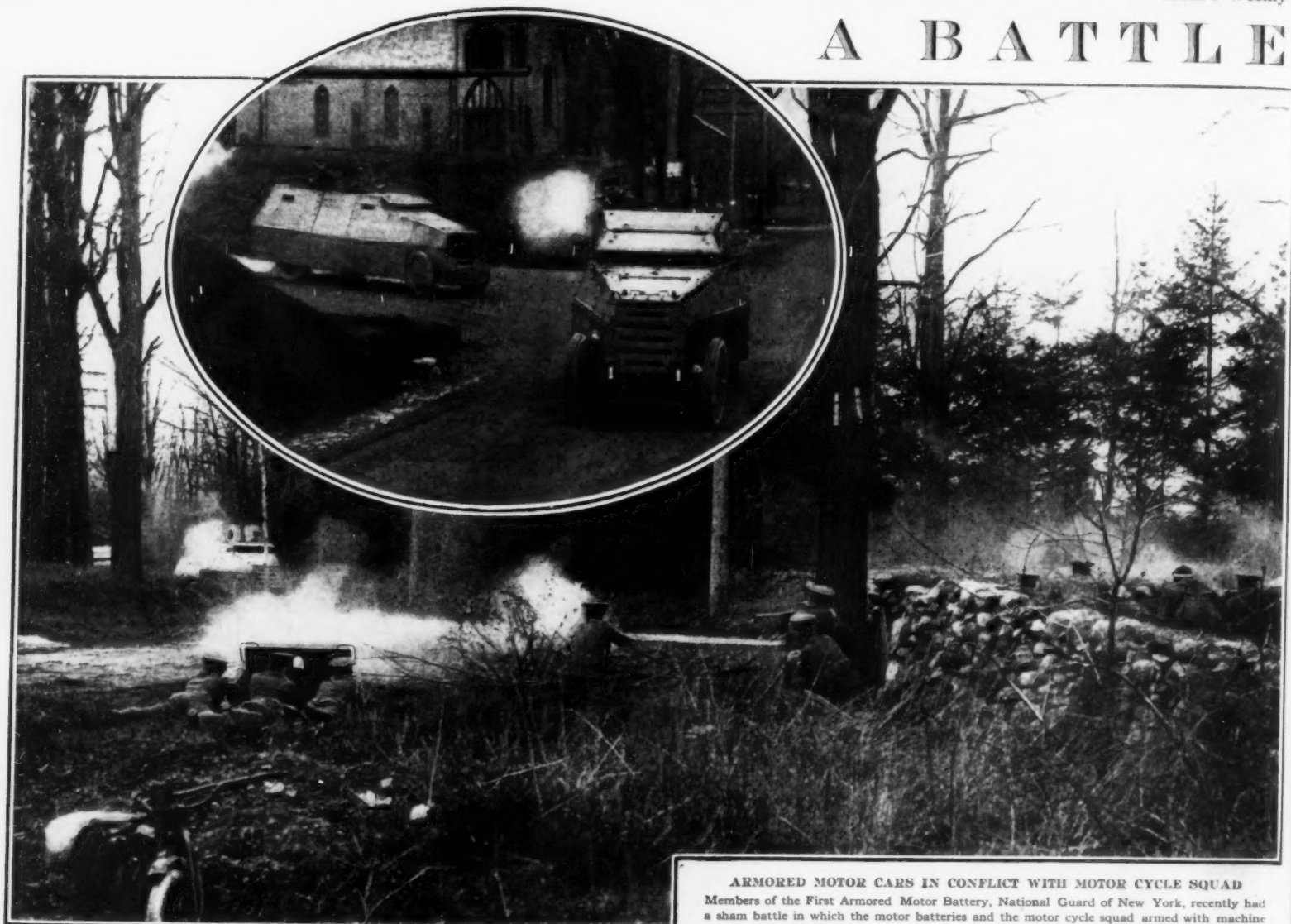
## THE HIDDEN FOE OF THE BATTLE SHIP

### EXPLOSION OF A SUBMARINE MINE

Next to the submarine torpedo, the submarine mine is the most deadly weapon of naval and coast warfare and the most difficult for ships to guard against. The greatest naval losses of the Russo-Japanese and the present great war have been caused by these two weapons. David Bushnell, the father of the submarine, was also the inventor of the mine, though the present weapon is far ahead of his clumsy keg of gunpowder which was discharged by the flintlock set to a time clock mechanism. Bushnell made his first mine in 1777. Later Robert Fulton improved it and Samuel Colt developed in 1863 a way of exploding the mine by electricity. The present complete system of mine defense owes much to General Henry L. Abbott, U. S. A., and to the work of the officers of the coast artillery corps. Not until the Russo-Japanese war did the mine get full recognition. Up to that time it had been used mainly for the protection of harbors and strategic points along coasts, but, by using mines in the open sea for offensive warfare, the Japanese were able to demoralize the Russian fleet and prevent any concentrated action against their own ships. By detailing a mine layer to follow in the wake of the battle fleet, dropping mines as it proceeded, and the by maneuvering the Russian ships into the mine field, the Japanese destroyed many of the enemy's best vessels. In the present war the work of mine layers and mine sweepers has been tremendous and many of the waters of the western coast of Europe have been loaded with mine fields and swept clean by sweepers many times. A submarine mine such as is shown in the picture, if exploded at the proper time, will put out of action or sink the largest warship. Many of the vessels lost at the Dardanelles were sunk by mines and the work of the Turkish coast defense is recognized as the most effective ever performed with this weapon. There are three types of mines in use at the present time: ground mines of large dimensions and of exceedingly heavy charges, which are laid directly upon the sea bottom and are used where strong currents would prevent the effectiveness of anchored mines; anchored mines which are attached by cable to a weight at the bottom and are held to float at a depth where they will be struck by a ship passing and explode; floating mines, which float upon the surface until they are struck and exploded by a passing ship. All floating mines are exploded by contact triggers and percussion caps. Electro-contact mines are a development of the simple contact type except that instead of a firing pin it, when struck, will invariably explode. They employ an electric circuit which allows their control so that contact does not mean explosion unless the switch at the shore station is closed. Ground mines are electrically controlled from shore stations. The explosives generally used in mines are dynamite, wet and dry gun cotton and gelatine compositions, but, during the past few months, many new higher explosives have been perfected so that the destructive power of the mine has been multiplied many times. The explosion in the accompanying picture took place recently off our north Atlantic sea coast. A column of water is seen thrown into the air to a height of nearly 350 feet.



## A BATTLE



## ARMORED MOTOR CARS IN CONFLICT WITH MOTOR CYCLE SQUAD

Members of the First Armored Motor Battery, National Guard of New York, recently had a sham battle in which the motor batteries and the motor cycle squad armed with machine guns and rifles in saddle boots, skirmished and maneuvered, each endeavoring to rout the other. The battle, though only blank cartridges were used, reproduced actual warfare to the minutest detail. In the oval, at the top, is seen the approach of the motor cars, their men and guns ready for action. The enemy motor cyclists are ambushed in an advantageous position. The upper half of the page shows the machine guns of the motor cycle squad trying to check the approach of the motors. That the motor batteries proved a superior force is seen by the hasty retreat of the cyclists in the lower picture. They are endeavoring to save their machine guns from capture.

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# ON AMERICAN SOIL



## FIELD WORK TRAINS THE AMERICAN SOLDIER FOR WAR ABROAD

The motor cycle squad, although the men defended gallantly the position they tried to hold, was finally completely routed by the motor batteries, seen in the upper picture charging across the strip of land the cyclists had recently occupied. Down the road, with the motors in hot pursuit the cyclists raced, as the oval shows, to another advantageous position. In the bottom picture the squad is seen, dismounted and making a final stand against the irresistible approach of the armored cars. Augmented by a supply truck, the men made a brave fight with rifles and machine guns from behind their steel shields but the broadside fire of the cars ultimately resulted in the defeat of the motor cyclists. The First Motor Battery, a valuable part of the New York Division, was a gift of patriotic citizens. Its equipment, valued at a quarter of a million dollars, includes 80 motorcycles, carrying two men each, and three armored motor cars.



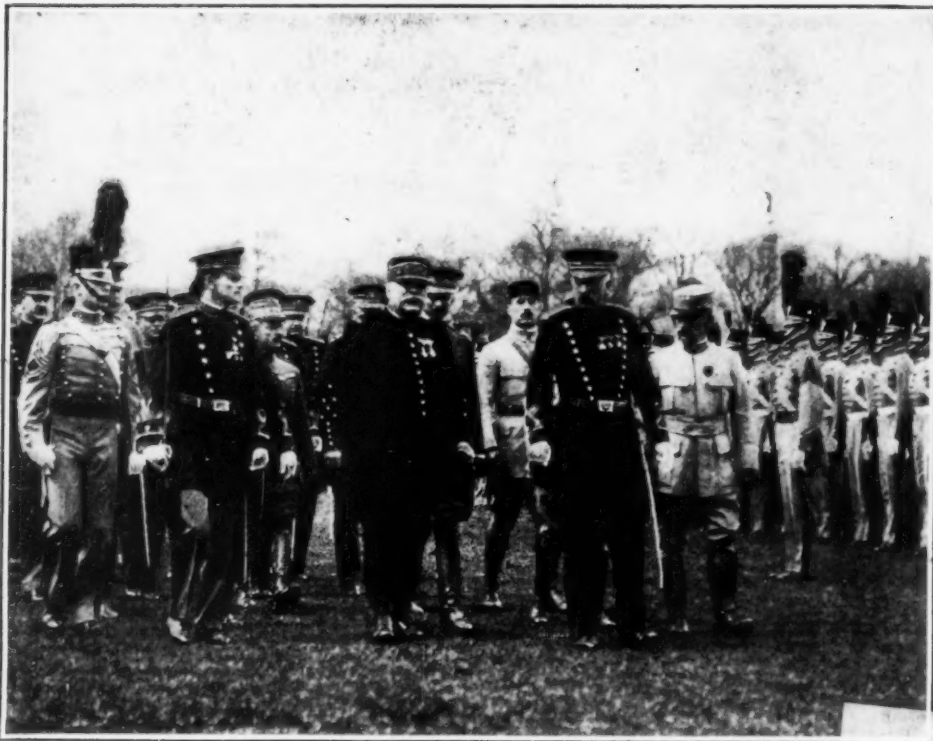
# AMERICA'S GREATEST CITIES GIVE



VIVIANI LAYS A WREATH ON FRANKLIN'S GRAVE

One of the most impressive and fitting ceremonies of the many marking the visit of the French Commission to America, took place in the old cemetery at Fifth and Arch Streets, Philadelphia, when René Viviani, French Minister of Justice, laid a wreath on the grave of Benjamin Franklin.

Monsieur Viviani in a short address told of the first meeting between Franklin and the great French philosopher, Voltaire, in Paris and compared the spontaneous friendship which resulted with that which exists between France and America today. The bond of sympathy was forged by Franklin.



"BULLY!" SAYS JOFFRE AT WEST POINT

After walking silently along the half-mile front formed by the cadet battalion at the military academy, Marshal Joffre gave perhaps his most eloquent expression of feeling when he borrowed Colonel Roosevelt's favorite exclamation, "Bully!" Later he expressed himself as more than satisfied with the type of officer the United

States will send to France. Joffre saw West Point as a fine example of military training, visiting the little stone farmhouse near Newburgh, which once was the headquarters of Washington, the first hero of the American Republic, and was decorated with the eagle of the Order of the Cincinnati, an honor bestowed upon no other Frenchman since Lafayette's death.



SCHOOL CHILDREN WELCOME FAMOUS

Philadelphia gave Marshal Joffre and Monsieur Viviani a rousing welcome and spent in the city on May 9th. Probably no demonstration during his visit to America touched "Papa" Joffre more deeply than that offered when he strode between the lines formed by 25,000 school children drawn up in Fairmount Park to welcome him to the home of William Penn. "The most beautiful enough



# GREET THE HERO OF THE MARNE



THE FAMOUS VISITORS

...and appropriate welcome of his tour" was Viviani's remark as General Joffre accepted the sword which the children presented to him. In Philadelphia, when the Commissioners visited the many spots of important historic interest, their passage through the crowded streets was marked with a tumultuous roar of welcome that has greeted them in every city minute enough to receive them as visitors.



UNVEILING BROOKLYN'S MONUMENT TO LAFAYETTE

When the Commission reached New York, the city gave such a welcome as has never before been extended to men from a foreign land. The picture above shows the unveiling of the statue of Lafayette in Prospect Park, Brooklyn, by Marshal Joffre. Near him stood the Marquis de Chambrun.

a descendant of Lafayette. The picture was taken as a young French girl, Lusienne Heiser, clad in Alsatian peasant costume came forward with a bouquet of flowers for the hero. He gathered her into his arms and gave her a kiss, the memory of which she will likely treasure throughout her life.



CHICAGO'S WELCOME WAS WARM

The second city of the United States repudiated Mayor Thompson, who refused to invite the Commission to Chicago. Public opinion obliged the Mayor to alter his decision. At mass meetings at the Auditorium Theatre and the Stock Yards amphitheater, great crowds cheered the visitors. In this picture, M. Viviani is seen with his

hand on the arm of President Judson, of the University of Chicago. Behind them General Joffre can be seen. From Chicago the emissaries went to Kansas City, returning by way of St. Louis, Mo., and Springfield, Ill., where they laid a wreath at the tomb of Abraham Lincoln as the tribute of France to the memory of a martyr to the cause of liberty.

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WILMINGTON

DELAWARE

## MEN WHO ARE MAKING AMERICA

(Continued from page 627)

when it came to placing the sash upon him and positively refused to have anything to do with it. He did consent to wear the coveted little button in the lapel of his coat, but whenever he was to meet Americans he turned down the lapel so that they couldn't see the button—"I didn't want to have my fellow-countrymen think I was trying to show off," was his explanation.

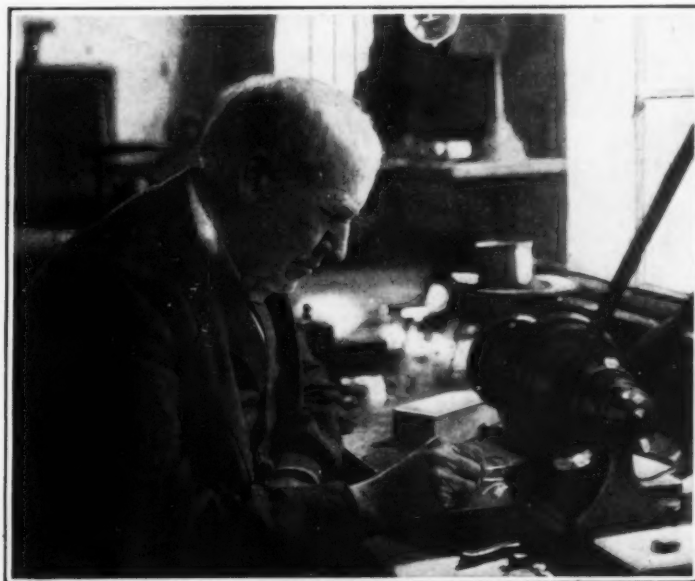
Perhaps the most pleasing tribute he ever received was during the great Preparedness Parade in New York in May, 1916, when the route of the procession resounded with shouts of "Edison! Edison! Edison!" as the veteran inventor marched at the head of his colleagues on the United States Naval Consulting Board. He was to have dropped from the ranks at a certain point, but, though the heat was intense, he refused to fall out. "I like it and they seem to be liking me," was his ultimatum to those who sought to persuade him to stop and rest. The acclaim of his fellow citizens, this spontaneous, enthusiastic reception mile after mile, went straight to his heart. The sincere applause of the multitude, of the rank and file of his own people, were more gratifying to Edison than all the diplomas and parchments and medals in the world.

Edison, like his friend Henry Ford, has always sought to produce things that would

on goose eggs trying to hatch them. He built a fire in a barn, watched it go up in flames and was publicly whipped in the village square as a warning to other boys. Before he was eleven he had gathered together a fearful and wonderful chemical "laboratory" in the basement of his home, and to make sure that nobody would interfere with his materials he marked every one of his 200 bottles "POISON."

Then, with another boy, he started cultivating ten acres of his father's farm and sold as much as \$600 worth of produce in one year. He became newsboy on the train running between Port Huron and Detroit, started two small stores in Port Huron in charge of other youths, met with no great success, and turned to extending his news vending by installing newsboys on other trains. His ambition was equalled only by his industry, as is shown in Dyer and Martin's excellent "Life of Thomas A. Edison," from which these early facts are drawn.

He started a laboratory on his train, using part of the unventilated smoking car which was never used by passengers. Next he installed a printing press in the car and actually collected, wrote, set up and printed all the news for his "Weekly Herald" and sold as many as 400 copies weekly, a feat which the London Times described as



#### THE MAN OF COUNTLESS INVENTIONS

Mr. Edison's first patent was taken out on June 1, 1869: it was designed to enable Congress to record and count votes instantaneously, through each member pressing a button at his desk. The proud inventor proceeded to Washington expecting to be received with open arms, but left bitterly disappointed, having been peremptorily told that the inordinate time consumed in taking a vote was one of the accepted methods of delaying progress and harassing opponents. This initial experience determined Edison to confine his efforts ever after to things for which there would be a keen and wide demand.

benefit the masses. Has any other living being added so much to the comfort, enjoyment, enrichment of the lives of his fellow mortals?

Milan, Ohio, has the distinction of being the birthplace of Edison. The book of life opened for him on February 11, 1847. His paternal ancestors were Dutch, but the family had lived in America for several generations. The members were noted for their longevity. The family, of modest circumstances, moved to Gratiot, Michigan, when Thomas Alva was seven. There the elder Edison dabbled in farming, the lumber business, and the grain trade. The boy had such an extraordinarily-shaped head that the doctor predicted brain trouble! The teacher at school pronounced little Thomas, who was always at the foot of the class, "addled," and at the end of three months he was given up as too stupid to receive instruction. That was all the regular schooling Edison ever received, his instruction thereafter being attended to by his gifted mother.

He did some queer things. When six he was missing for a while and was found sitting

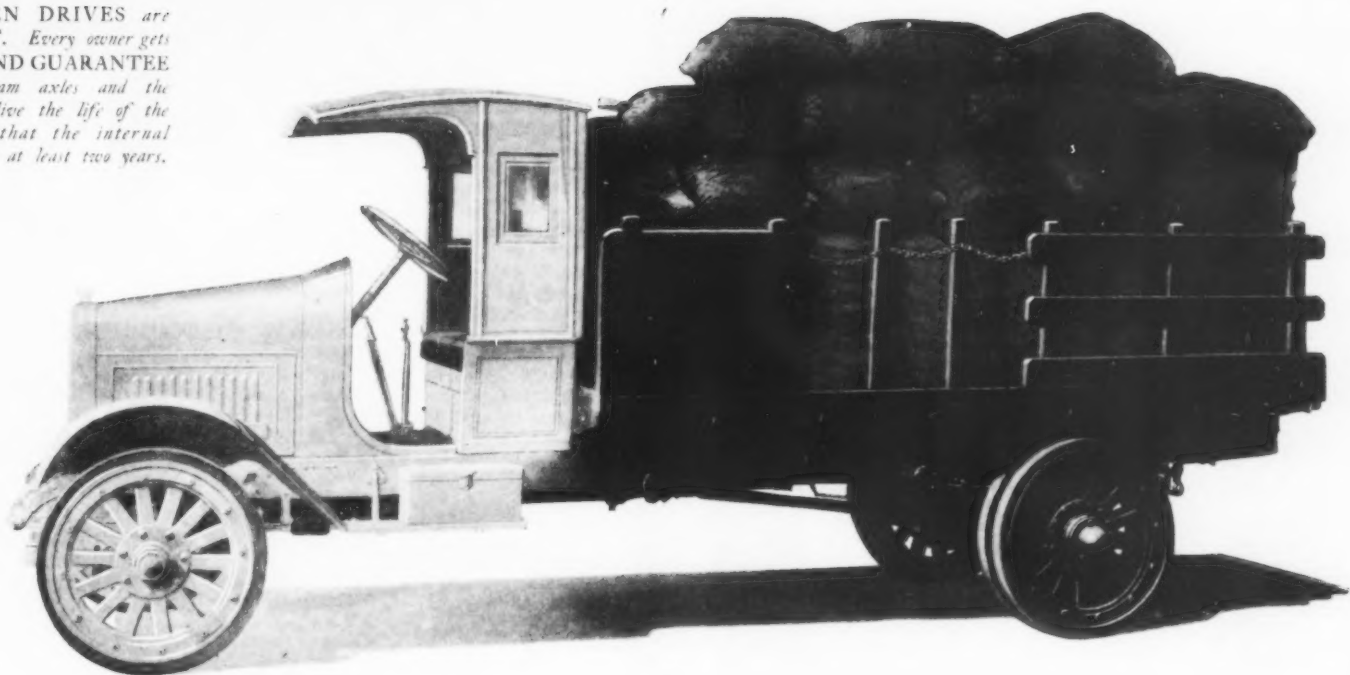
notable in that this was the first newspaper ever printed on a train in motion. His ingenuity manifested itself in diverse ways. During the War between the States he bribed railway telegraph operators to send bulletins to each station announcing the most sensational events of the day with the result that when "Newsy" Edison came along with his papers there were crowds waiting at every station to buy them. On special occasions he charged exorbitant prices. His laboratory was growing steadily, until one day the train lurched badly, a stick of phosphorus fell on the floor and the car caught fire. The enraged conductor pitched Edison and all his belongings off at the next stop, boxing Edison's ears hard enough to cause the acute deafness from which he has ever since suffered.

About this time Edison saved the life of the local station agent's daughter by snatching her from in front of an approaching train. The grateful father offered to teach the young man telegraphy and for six months Edison worked eighteen hours daily.

(Continued on page 638)



TORBENSEN DRIVES are made to LAST. Every owner gets a GOLD BOND GUARANTEE that the I-beam axles and the spindles will live the life of the truck; and that the internal gears will last at least two years.



## The REAR AXLE carries 80% of a truck's load!

THE vital part of a truck is the part that has to carry 80 per cent of the load and, at the same time, transmit the power to the rear wheels—the *Rear Axle DRIVE!*

Just as it was *motor* trouble that retarded the early development of the *pleasure car*; so it has been *rear-axle* trouble that has retarded the development of *trucks*.

Pleasure cars are built for *light* loads; trucks, for *heavy* loads.

And four-fifths of the weight of these heavy loads rests on the truck's rear axle. It must be **STRONG**.

It must also be proof against the jars and shocks of rough roads on *solid* tires.

In addition, it must transmit power—and do it *efficiently*.

The TORBENSEN Drive dominates the truck rear-axle field today, chiefly because it meets these practical truck requirements *better* than they have been met before.

The TORBENSEN Drive is really two axles. One is for *load carrying*; the other is for *driving*. The *load-carrying*

axle, which is I-beam construction (the strongest and lightest form of steel construction known, and an exclusive patented feature of TORBENSENS), carries the load.

The power is transmitted through an axle which is separate. And the power is applied *at the wheels themselves* and *near the rims*—instead of, *at the center*, the old-fashioned way.

So this additional *leverage* reduces the strain to a *small fraction* of the strain on the turning member of an *ordinary* axle; and by being wholly independent of the load axle, the gears of the differential can't possibly be jarred out of adjustment or alignment by the jolts of cobblestones or rough roads or by the jerking of trailers.

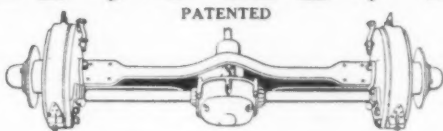
These are the main reasons why the Torbensen Drive has solved the truck problem; why more Torbensen axles are being used than any other kind of drive; why they are being used by the most progressive truck makers; and why these makers have become the *largest* truck makers in the world.



# TORBENSEN-DRIVE



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## MEN WHO ARE MAKING AMERICA

(Continued from page 636)

He became proficient enough to build a line a mile long from the station to the village and was appointed telegraph operator at Port Huron. As he used to leave messages unsent and undelivered while he conducted experiments, his services were dispensed with.

Edison's next move, in 1863, was eventful. He found a job as railroad telegraph operator at the Grand Trunk Station of Stratford Junction, Canada. Here also his experiments landed him in trouble. Night operators had to tap the word "six" every hour to the superintendent to make sure they had not gone to sleep. Edison promptly invented a contrivance which clicked off the required signal every hour so that he could enjoy snoozes in comfort! One night a train was allowed to pass, and as another train was coming from the opposite direction on the same track, Edison, having frantically but vainly tried to send the engine driver a warning, promptly bolted for the border. For the following five years he was a roaming telegraph operator. Drifting to Boston he invented a stock ticker and established a small stock quotation business and also introduced a method of telegraphing between business concerns, a method so simple that anyone could understand and work it. But business became bad and, deciding to leave Boston for New York, he had to let his books, instruments, etc., remain as security for debts. Arriving in New York he had not a cent with which to buy food. Seeing a tea-taster at work, he begged him for some tea, and this formed his first breakfast in New York.

Three days later Edison was sitting in the offices of the Gold & Stock Telegraph Company watching the gold ticker at work—speculation in gold was then at fever pitch. Suddenly scores of boys rushed into the place excitedly explaining that the ticker in their employers' offices had stopped working. Dr. Laws, head of the concern, also arrived breathless. The apparatus had broken down. Edison calmly told Laws that he thought he could fix it and proceeded to do so. The grateful and astonished doctor asked the stranger his name, and next day subjected him to a quizzing-bee and put him in charge of the whole business at a salary of \$300 a month. When the hungry, penniless, out-of-work operator heard the amount he was to receive he nearly fainted.

In his new surroundings Edison found vent for his genius in improving the ticker and bringing out many allied patents. He also at the same time formed the firm of "Pope, Edison & Company, Electrical Engineers and General Telegraphic Agency," and began to do important work for the Western Union Telegraph Company. When the head of the Western Union asked Edison how much he would consider reasonable for a certain patent, Edison tried to summon up enough courage to ask \$5,000, but the sum was so much that he could not bring himself to name it.

"How would \$40,000 strike you?" he was asked. He decided it would do very well.

With this capital he started a plant of his own in Newark, declaring he did not like the idea of "keeping money in solitary confinement." He was soon employing fifty men making stock tickers and other instruments. Business prospered to such an extent that two shifts were employed. Edison acted as foreman of both, working night and day with only occasional half-hours for sleep in out-of-the-way corners of the shop. Here he began in earnest his life of invention. Among the earliest of his patents was an automatic telegraph which could send and receive 3,000 words a minute and record them in Roman type. He also took hold of a typewriting machine and developed it into the practical Remington now of universal use. In 1873 he went to England to introduce his automatic telegraph and also his quadruplex telegraph instrument, which had cost him prolonged



CHARLES M. SCHWAB

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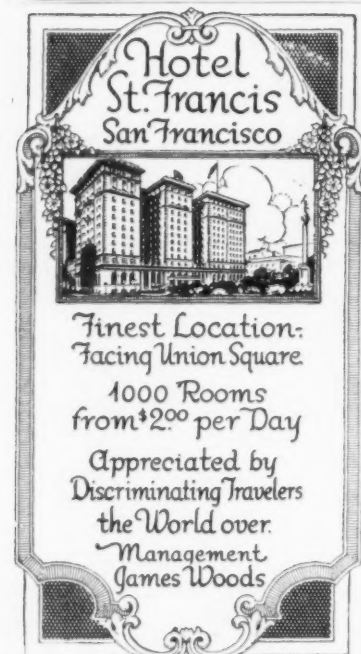


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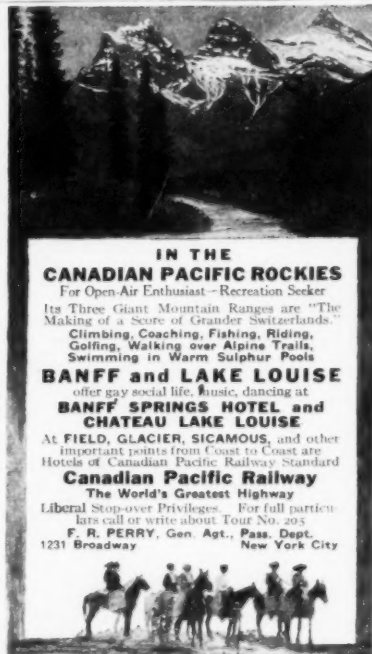
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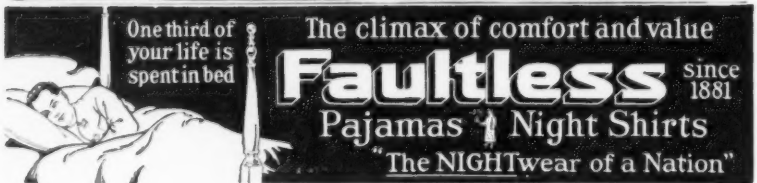
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study and experiment. The mimeograph was another important achievement of the early 70's. At one time forty-five different inventions were being worked on in Edison's plants—by this time he had five shops going.

His early "system" of bookkeeping was at least original, but it did not do credit to his inventive powers. All bills were slapped on one spike and not one of them was paid until legal proceedings had been taken; then, when the order for payment came along, Edison paid the bill plus the legal costs and transferred the bill to another spike. Tax assessments were treated the same way, but on one occasion it was impressed upon him that if he did not pay a certain tax by a specified date twelve per cent additional would be levied, involving quite a sum. On the very last day of grace, Edison took up his station at the end of the long queue, but when he finally got to the tax receiver his mind was so full of other matters that he forgot his own name and, being absolutely unable to recall it, was summarily turned back to the end of the line, with the result that, as closing time came before Edison could again reach the desk, he had to pay the extra levy.

For his famous carbon telephone transmitter, Edison was offered a lump sum of \$100,000 from the Western Union, then in a death-grapple with the Bell people. Edison, knowing his weakness for making money go, stipulated that the sum be paid him at the rate of \$6,000 annually for seventeen years, an arrangement which the W. U. jumped at, for this was virtually only interest on the money. He repeated this extraordinarily poor business arrangement some time later when the Western Union offered him \$100,000 for his electro-motograph. The Western Union did not lose anything by these deals with Edison, for the company sold out to the Bell interests for a big figure, including a substantial royalty on the use of certain of its patents.

Most of Edison's inventions have been the result of innumerable experiments, but one of the most notable, the phonograph, worked at the very first trial. It was characteristic of Edison, however, that he spent ten years improving it before he exploited it commercially, among his final sessions on it being one of five days and nights without a moment's sleep.

The hardest and perhaps the greatest of all Edison's achievements was begun in the late 70's, and today his labors in this field are yielding employment to hundreds of thousands of wage earners and many hundreds of millions of capital. I refer, of course, to his system of generating, regulating, measuring and distributing electricity for light, heat and power. In evolving his incandescent lamp Edison ransacked the earth for suitable materials. He tested 6,000 vegetable growths, brought from all parts of the globe in his search for an ideal substance for use as a filament inside the glass bulb. At first a piece of carbonized cotton thread was used, later a certain kind of bamboo yielded a better fiber, but finally all carbon filaments were discarded in favor of metallic ones.

The immensity of Edison's task in inventing and establishing the first electric lighting plant in New York, at Pearl Street, in September, 1882, involving not only the

construction of absolutely new forms of machinery and apparatus, but in laying the necessary wires, in originating methods and apparatus for regulating and sub-dividing the current, in inducing people to agree to the installment of the little-tested invention, and in solving a thousand problems never solved before—the immensity of this burden, I say, cannot be grasped at this day when a generation of experience and familiarity with electric lighting has led us to accept everything pertaining to it as a matter of course.

At the end of 1882 only 225 buildings in New York had been wired, including the offices of J. P. Morgan, who became one of Edison's admirers and supporters. For three months the current was supplied free to those brave enough to allow their places to be threaded with the mysterious wires which, it was feared, might start fires or cause explosions at any moment.

Electric railway experiments next arrested Edison's chief attention, and by using the track for a circuit, he achieved wonderful results. He built an electric line at Menlo Park, N. J., in 1880 and 1882, then his headquarters, and it attracted railroad builders and engineers from all parts of the world; but somehow they were not as quick as Edison to grasp the possibilities of the field thus opened up.

The worst financial blow Edison received was the abandonment of his extensive plant at Edison, N. J., for magnetic ore milling. This was "the most colossal experiment Edison ever made," his associates record. When it was given up, chiefly because of the discovery of unlimited quantities of rich ore in the Mesaba Range, Edison's whole fortune had gone and he was heavily in debt. "As far as I am concerned," he declared philosophically, "I can at any time get a job at \$75 per month as a telegraph operator and that will amply take care of all my personal requirements."

There followed Edison's epochal inventions for the manufacture of cement—half the Portland cement produced in America was later made in Edison kilns. In one day, of almost twenty-four hours, Edison personally prepared detailed plans for his first cement plant covering a length of half a mile, a feat regarded by those best qualified to judge as the most stupendous ever performed by a human brain. From the manufacture of cement to the "pouring of cement houses" was a logical step—and, incidentally, Edison believes this method of construction is only in its infancy.

Of late years the electric storage battery, wireless apparatus, the Edison-Sims torpedo and other submarine problems, improvements in the phonograph, the dictating machine, the inventing of "speaking motion pictures," and household labor-saving devices have claimed most of the master inventor's time and talent. Naval problems have been his chief concern for the last two years, and just at present "I am working day and night for my Uncle Sammy," is the typical Edisonian message sent me.

President Wilson in paying tribute to Edison on his seventieth birthday, wrote: "He seems always to have been in the special confidence of Nature herself." If he is, it is because he has worked harder and more intelligently than any other living man to wring her secrets from her. His success has been paid for.



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### POSSIBILITIES OF AN EARLY VICTORY

BY CHARLTON BATES STRAYER

UNQUESTIONABLY a great shock was felt throughout the country at the War Department's announcement that the Government was preparing for a three years' war, and the unofficial statement from British sources at Washington that the war might last ten years. Facts must be driven home to arouse the people of the United States who are still going to their daily work and indulging in their customary pleasures without realizing that this country has entered the most gigantic conflict of the ages. There are many reasons why the war cannot be continued indefinitely. First of all the belligerent powers cannot prolong for years the present drain upon their resources of men, food and money. France, whose gallant fight will challenge the admiration of the centuries, some time ago passed the zenith of her man power. Great Britain has not reached this point, but her resources are not exhaustless, and the strain of bearing the financial burden of her Allies has been tremendous. The Allied commissioners have plainly stated that they must soon have the reinforcement of our armies if they are to win the war. Great Britain now acknowledges that her daily war bill is almost a million and a half dollars an hour, a tax that no nation can long endure. No one knows what the war is costing Germany and her allies. We are only certain that the cost is staggering, and that in the depletion of her manhood reserves the situation may be even worse than that of the Allies. The potential resources of the United States in gold, in men and in foodstuffs swing the balance in favor of the Allies in a long war, provided the submarine wastage may be checked.

Other evidences that peace may not be far off are the disposition to make concessions and the peace propaganda. From Swiss sources comes the report that Turkey is willing to grant concessions in Palestine and to offer the internationalization of the Dardanelles. Of all the belligerents none has more ardently desired peace than Austria-Hungary, but always Prussia succeeded in checking it. There has now developed in Germany a peace movement that is hard to stop. When the Allies, in reply to President Wilson's request, stated their peace terms, Germany was silent. Today all parties unite in demanding of the Chancellor that he state Germany's terms. The German people are not united on the questions of indemnity and annexation, and it is not clear whether there is a desire to speak to all the powers or to Russia alone. Dr. Egan, our minister to Denmark, warns that "any peace suggestions by Germany at this time merely aim to eliminate Russia as a military force and to obtain the Russian larder." Should Germany realize this aim the Allies would then face a drawn-out contest, and upon the shoulders of Uncle Sam the chief burdens would rest.

Ex-President Taft has said that if Emperors William and Charles abdicated tomorrow "we would have peace in two weeks." But is there any likelihood at present that either will abdicate, voluntarily or under compulsion? Dr. Egan, United States Minister to Denmark, says the German people firmly believe in their ultimate victory, and that "there is not the slightest reason for believing that the Hohenzollerns will suffer the same fate as the Czar." So scant is the news coming from Central Europe that no one is able to estimate just to what extent the Russian revolution has influenced the growing spirit of democracy in Germany. A Swiss writer in the *Gazette de Lausanne* declares that the Empire is "beginning to crack and that big fissures, which are perhaps still invisible to the naked eye, are already developing." The bitter attacks upon Chancellor von Bethmann-Hollweg are veiled attacks upon the Kaiser himself. Con-

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stitutional reforms, taking from the Kaiser the unrestricted right to make army and navy appointments, are an entering wedge. Maximilian Harden, the most outspoken voice in Germany, says in *Die Zukunft*, "The responsibility of the peace that must come cannot be carried by a Kaiser or by a dynasty, but by the whole people. Democracy cannot be stopped; it has become overnight the Kaiser's own paramount need." A Vienna dispatch says the Hungarian opposition to Count Tisza will not slacken until the Premier is forced to retire. Peace, many believe, is more likely to be ushered in through political upheaval in Germany and Austria than by the military or economic collapse of the Central Powers.



to the minutest detail, Germany excelled anything before known. The mobilization of her vast armies, perfectly equipped, in the first few days of the war, will remain one of its most marvelous incidents. Back of this was preparedness that had pervaded and moulded every trade and industry. Her strategic railways and magnificent merchant fleets were parts of military preparedness. Her dye and chemical industries not only made her supreme in these lines in peaceful trade, but were readily adapted to the manufacture of explosives. All was ready for a short campaign that would batter down enemies unprepared. Germany was not prepared for a three-year conflict, nor did her plans take into account possible defeat. This explains her financial policy from the start. While England's policy has been the sound one of taxation to pay a large part of the expenses of the war, Germany has borrowed huge sums from all her loyal subjects with the expectation of making her enemies pay the bill. This is the force that still drives her on in the hope of victory and big indemnities, the only alternative to economic disaster and debt repudiation. The Bavarian *Staatszeitung*, organ of the Bavarian Premier, declares that Germany does not expect indemnities and says that agreements with her enemies to secure raw materials, protection of German interests in foreign countries, the return of her ships and colonies and permission to develop foreign trade would be better than an indemnity of many millions. The *Kölnische Volkszeitung*, more correctly interpreting German sentiment, expressed indignation at the suggestion that indemnities should be waived, declaring that without them the financial independence of Germany would suffer more than that of any other State.

### THE PASSING CRISIS IN RUSSIA

Next to the success of her submarine campaign, Germany looks to a separate peace with Russia, or, if that fails, Russia's

elimination as an aggressive factor, to make her victorious in the war. One theory of the Russian revolution is that it was engineered by pro-German influences in Russia in order to bring about a separate peace. The Provisional Government is strongly loyal to Russia's allies, but Germany has been able to continue her peace propaganda through pro-German Socialists in Russia. The mission of Lenine, expatriate under the old Russian régime, sent back to Petrograd by Germany to preach a separate peace, proved a failure. The Provisional Government has also received the support of the Council of Workmen's and Soldiers' Deputies who, by an overwhelming vote of 1000 to 112, backed up the new war loan known as the "liberty loan." The American Federation of Labor

has cabled the executive committee of the above council assuring them of the sympathy of American wage-earners in their struggle for a democratic government, and warning them that the Socialists who are advocating a separate peace are working in the interests not of Russia but of Germany.

In an International Socialist Congress to be held at Stockholm in June, Germany expected to make her strongest bid for a separate peace with the Socialists of Russia. The peace terms and the invitation of the Russian Socialists to join the Congress had been entrusted to M. Borgbjerg, the Danish Socialist leader, by Germany. A conference of the extreme wing of the Socialist Party

in Russia voted not to participate in the Congress in view of the fact that M. Borgbjerg was acting in agreement with Philip Scheidemann and other German Socialists who had gone over to the side of the German Government. The intrigue of the German Socialists is even at work in the United States. A conference of prominent Socialists at Washington under the leadership of William E. Walling, Charles Edward Russell and Ernest Poole, denounced the American delegates to the Congress—Morris Hillquit and Algernon Lee—as pro-German, and called the Congress itself "the most dangerous of all the Kaiser's plots for cashing in his military victories." The State Department has decided to refuse passports to any American Socialists who contemplate going to Stockholm to urge a separate peace.

### THE MINUTE-WOMAN

Behold the minute-woman fair

Of 1917;

Her villa by the summer sea,

Her yacht and limousine,

The pleasures of the social year

Without regret she quits,

To toil with bandages and lint,

And drugs and comfort kits.

Her fingers may be needle-pricked,

Her head and back may ache,

She does not mind, but labors on

All for the soldier's sake;

And when our troops have marched away

To face the shot and shell,

She'll do the tasks they leave behind,

And she will do them well.

True daughter of the minute-man

Of Freedom's dawn is she,

A nurse's simple uniform

Succeeds her finery;

Recruiting service, too, she does

In intervals between,

Hail to the minute-woman brave

Of 1917!

—MINNA IRVING.



## Men of Tomorrow

Many a boy, started off with a sorry fund of health, has been built into a mental and physical "husky" by helpful environment and properly selected food.

No one can build a sturdy, time-resisting wall with poor materials. No one can build a strong, manly boy on flimsy food.

The boy is really more important than the wall!

Ever think of that?

You may be very particular when you inspect the materials you are to put into your house walls.

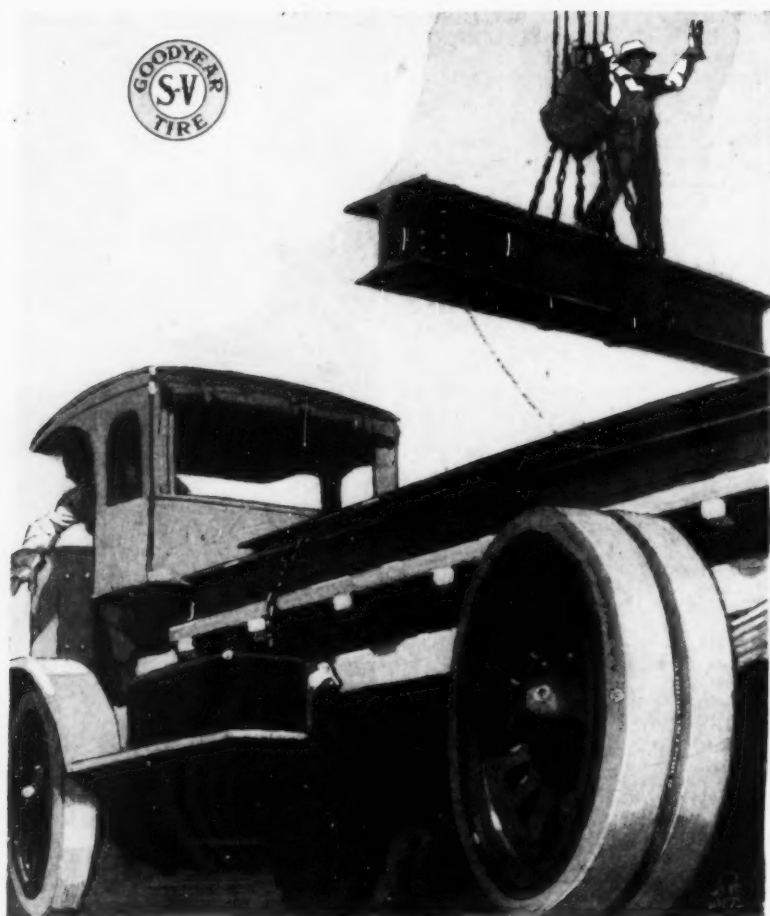
But how about the boy—is his building material being considered?

A true Brain and Body food is

## Grape-Nuts

It possesses those vital elements required by Nature for building up strong young bodies and active brains.

"There's a Reason"



## Why Is One Truck Tire Better Than Others?

In all kinds of service, on all sorts of roads, in all states and many countries, the Goodyear S-V Pressed-On Truck Tire has proved its marvelous superiority.

Proved it by doing all the things a tire can to reduce the cost of efficient cartage.

### Why is the S-V better?

Design is one factor. A cross-section of the S-V shows gum distributed to form the most efficient cushion of which solid rubber is capable, to present the broadest possible surface to road wear and still resist all cutting and chipping at the edges.

But what's *in* the tire counts most. New rubber only, of the highest grade, is used. No shoddy ever finds its way into S-V's. Minerals are necessary to attain the proper toughness, but in this tire there is more rubber in proportion to the mineral than in others.

These are the final reasons for S-V superiority. They account for S-V's marvelous performance—mileages up to 20,000 on country routes and 40,000 in strenuous city service.

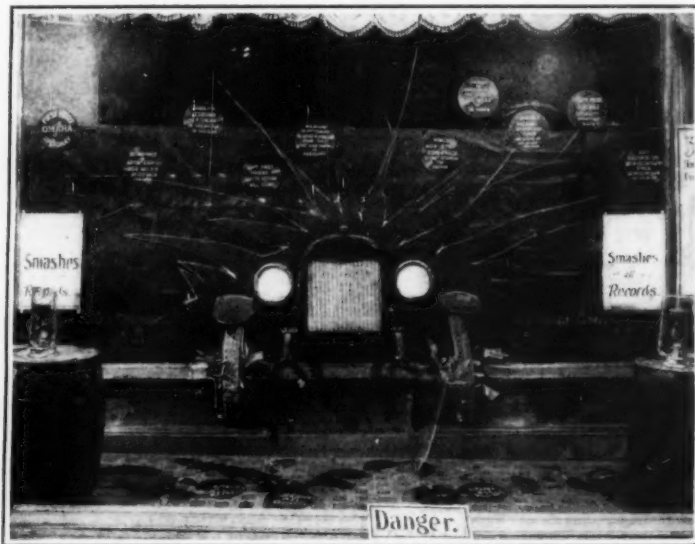
They tell why one truck tire is better than others.

**GOODYEAR**  
AKRON

## MOTOR DEPARTMENT

CONDUCTED BY H. W. SLAUSON, M. E.

Readers desiring information about motor cars, trucks, delivery wagons, motorcycles, motor boats, accessories or State laws, can obtain it by writing to the Motor Department, LESLIE'S WEEKLY, 225 Fifth Avenue, New York City. We answer inquiries free of charge.



A CLEVER WINDOW DISPLAY

This car broke several records for automobiles in its class. The dealer simulated a broken glass front in his store window, and against this placed the distinctive radiator and half of the front wheels of the car. Groups of imitation phonograph records, bearing the names of the economy, non-stop and endurance records, which were broken, were scattered around the window and sidewalk. Naturally the spark-plug contributes largely to the success of any such performance.

## THE "HOW" AND THE "WHY" OF SPARK-PLUGS

EDITOR'S NOTE:—This is the third of the "How" and the "Why" series, which is to appear twice a month in the Motor Department. The previous subjects discussed in this series were the "How" and the "Why" of the Shock Absorber, May 10th, and the "How" and the "Why" of Tire Care, April 26th.

### "DANGER! 10,000 VOLTS"

YOU don't need a second warning to keep you away from that highly-charged power cable when you see that sign—even though you may not know what a volt is. It is enough that you know that certain death lurks within those wires.

And yet every spark-plug in a gasoline engine carries from 12,000 to 20,000 volts at every other revolution of the motor—15,000 volts, say, shooting through this tiny mechanism from 200 to 1,500 times per minute!

And you expect that spark-plug to be so made that not an ounce of power will escape during the explosion, even though you know the explosive pressure runs as high as 2,500 pounds per square inch!

And although you know the effect on a glass or iron shell when it is suddenly plunged into water some 100 degrees hotter than the surrounding air, you expect the lower parts of your spark-plug to be subjected to degrees of temperature ranging from the four thousand of the explosion to the four or five hundred degrees of the incoming charge, without a murmur!

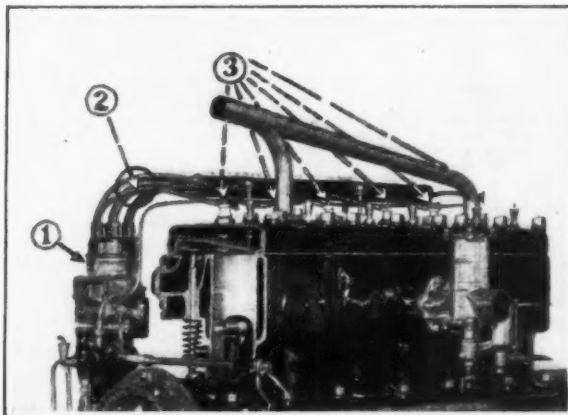
And you expect this peaceful, uncomplaining operation of the plug to continue in the midst of flying oil, choking gasoline fumes,

and carbon accumulations that would discourage many a more expensive mechanism. Just what do you want?

To be brief you want a good spark-plug—no matter what kind of a car you drive, for the conditions outlined above prevail in every gasoline engine whether large or small. They prevail, to be sure, in varying degrees and in varying combinations, and for this reason alone, every up-to-date spark-plug manufacturer must produce a variety of designs. The best grade of one type of plug should not be expected to give satisfactory service in an engine designed for a plug of a different form or having totally different structural features which make it suitable for use in another engine.

Without going into the scientific facts of a volt or an ampere, it is merely necessary to remember that voltage represents pressure, and that the average motorist can safely pry around his ignition wires when they are charged with from 15,000 to 25,000 volts because the amount of electric current is so infinitely small. It is the induction coil or transformer which has changed the six volts of the battery or magneto to the high-tension, eager, nervous, snappy fluid in the spark-plug wire.

(Continued on page 644)



### ALL SPARK-PLUG SYSTEMS EMBODY THE SAME PRINCIPLE

1. The distributor and timer in which the current forming the spark is switched to the proper spark-plug and timed correctly.  
2. The high tension wires conducting the 10,000 or 15,000 volts from the distributor to each spark-plug. Note the thickness of the insulation on these wires.  
3. The usual location for spark-plugs in a six-cylinder engine; in some cases, however, these may be placed in the side wall of the cylinder, or in any other location in which the spark will be made to occur close to the center of the explosive mixture.



## WHEELS UNDER TWENTY ARMIES

(Continued from page 626)

ways must be ready at a moment's notice to transport raw material and fuel to shipyards, armor plants and naval coaling stations. They must ship arms, ammunition and other military and naval materials to any part of the country. Then there is the problem of transferring troops from all sections to training grounds and mobilization points.

Now all these purely military functions, which will immensely increase the present railway business, must be carried on not only without delay but also with the least possible interference with civil traffic. In case of invasion, roads parallel to the threatened coast line, or leading to it, would have to be prepared on short notice to assemble thousands of extra cars and locomotives.

In performing these services two classes of railroads are used, the commercial and military. The former serve most mobilization purposes. Those who have studied war maps are aware of the vast network of roads back of the trenches, a net so thick that to a white map of ordinary size it gives a grey shade. These are temporary military roads, built and operated by the army and moved frequently as the line advances or retreats.

The fundamental principles of operating these two classes of roads are the same. Each, however, has its peculiar problems and rules. The co-ordination and management of our commercial railroads for the handling of troops and supplies is the big question that is interesting the American public today, constituting, as it does, a major feature of national preparedness.

As a foundation for this co-ordination a clause of the federal statutes gives the government absolute control of the railroads for military purposes, and this authority is exercised by the quartermaster corps of the Army.

And the task of this arm of the service is an enormously complicated one. The vast web of our railroads covers thousands of different routes and is in the hands of hundreds of separate corporations. In order that the quartermaster corps may handle troops and supply trains effectively, it is necessary to have every possible route carefully laid out, including stopping points, length of sidings, junctions, capacity of terminals, and loading and unloading facilities. Failure to take into account any one of these details might cause fatal delay at a critical time. The young man applying for his commission is only one small cog in this great system, but a consideration of a few of the many things he must know shows how important is such a cog and how necessary that the applicants for such commissions be of high grade.

Here is a brief outline of his duties. Before a body of troops is entrained, the time and place of every move is mapped out, including the date and place of entraining, destination, time of arrival, route, assembly point, time of troops leaving assembly point, route from assembly point to train, time of arrival at station, time of boarding train, time of departure of train, rate of travel over each section of route; time, place and duration of stops, time and place of feeding troops and animals, and a schedule showing the assignment of troops and equipment to each car. Aside from this are countless details connected with procuring supplies, the disposal of troops and their care.

All these preliminary arrangements must be made by an officer of the quartermaster corps. The first thing to be done is to procure lists, with weight, of all property to be shipped, obtain this material and make out the bill of lading. This, with the number of men and officers, constitutes a basis on which he estimates the number and kind of cars needed. He then engages the cars and provides loading facilities, such as material for blocking and lashing, and constructs necessary ramps, or runways for entraining animals or wagons. Next, on the arrival of

the cars, he inspects them from a thousand major and minor angles. All cars must be clean. Passenger cars must be fully supplied with water and ice, sufficiently lighted and heated and all other appurtenances in proper condition. Stock cars come in for special attention. Some of the things that may cost the Government money and dumb allies much suffering are projecting nails, bolts or splinters, loose boards and rotten flooring, broken fixtures on hayracks, doors or troughs.

Then the number of men or kind and quantity of supplies allotted to each car is marked on the side or steps together with the name of the organization. In loading men three are assigned to each section in tourist sleepers, or three to each two seats in a day coach.

In making up trains it is preferable to have sections of moderate size and good speed, rather than long trains with slow speed. Our war department requires a maintained speed of 25 miles an hour, twice that of France or Germany.

Another important point is to keep the troops of each unit with all equipment together. This is important in case of sudden attack. Imagine the fate of a unit of troops suddenly detained at the firing-line without equipment.

A possible element of delay lies in the timing of the arrival of troops at the station. There must be no time lost by cars waiting for the troops. The facilities for loading animals and wagons at each station on each route should be part of the quartermaster corps' records. Quick and noiseless loading and unloading of animals without confusion is an art in itself. Dispositions of individual animals must be studied. Gentle animals should be placed opposite doors and therefore loaded last. The time of loading and unloading has been carefully tabulated and should not exceed the following: Infantry, one hour; cavalry and light artillery, one and one-half hours; heavy artillery and engineers with bridge train, two hours. All movements, loading, entraining, detraining, feeding and watering and exercising men and horses are made in military formation.

With each train kitchen cars are provided. Otherwise baggage cars are fitted up by troops or arrangements made for procuring meals, or at least liquid coffee, at station-en route. Feeding men and animals is in itself no small matter.

All these problems are vastly more complicated in America than in Europe, where the longest troop train run is only 700 miles and mobilization is accompanied by temporary suspension of civil traffic. In America we have runs more than 3,000 miles long.

The United States, however, as a ground-work for military railway preparedness, has an exceptionally efficient railway system, including 260,000 miles of rails, or four-ninths of the total mileage of the world. We have 65,000 locomotives, most of them more powerful than the European engine; 60,000 passenger coaches and 2,500,000 freight cars, largely of superior size and strength.

In this mammoth struggle into which we are embarking, however, we must remember that there are no precedents. The ratio of munitions to be transported is at least 100 times the amount used in any previous war. Against 111,000 men mobilized last summer at the Mexican border, when railway facilities were greatly taxed, we may have to assemble now a million and a half or more at a time.

At present writing this number seems conservative. It is believed by experts that 3,000,000 men would be needed adequately to defend the nation. The original estimates of the War Department, however, are based on about half that number, that is, twenty field armies of 82,000 men each, or 1,640,000 men. In moving such a military

(Continued on page 648)



Bridge across the Hillsboro River—Tampa, Florida

## What Goodyears Are Built to Do

The best thing an automobile tire can do for its user is to deliver him extreme mileage and exempt him from ordinary troubles.

That is precisely the service to which Goodyear Tires are built.

The various Goodyear features—the On-Air cure, the No-Hook bead, the Rubber-Rivet construction, the Braided Piano-Wire base, the All-Weather tread and the like—are pointed directly to this end.

The effort of Goodyear workmen, the goodness of Goodyear materials, the methods of Goodyear manufacture are focused in the same direction.

How well these factors combine to the results desired, may be seen in the service being delivered by Goodyear Tires everywhere, every day.

How far this service surpasses that ordinarily given, may be seen in the fact that more Goodyear Tires are sold in America than any other brand.

Goodyear Tires, Heavy Tourist Tubes and "Tire Saver" Accessories are easy to get from Goodyear Service Station Dealers everywhere.

The Goodyear Tire & Rubber Co., Akron, O.

**GOODYEAR**  
AKRON



A stretch of concrete on the Twin Hills Road between South Manchester and Hartford, Connecticut. Built by Bristow Bros. and Knowles Corp., Contractors, Providence, Rhode Island.

## How Concrete Roads Save Gasoline

EVERY motorist has observed how his car accelerates when he goes from an unimproved road to a stretch of concrete; but he may not realize how large a saving of power and gasoline that acceleration represents. If he were to travel over a hard even surface habitually instead of over the average country road, his gasoline bill would be greatly reduced. A motorist in Mississippi has figured out that concrete roads in his community save him \$30 per year in the gasoline consumed by a single car.

## Reduce All Items of Operating Cost

Concrete roads lessen all other items of operating expense. The strain on tires is immeasurably reduced. On the hard, gritty surface they can grip better and do not skid. There are no loose stones to bruise the fabric.

The car rides smoothly without lunging and plunging over mud holes and ruts. The chassis lasts much longer and keeps in better repair. The engine has a smooth, even pull.

The frame, springs and transmission suffer none of the racking due to rough roads. The car depreciates much more slowly and costs less for repairs and renewals.

Any permanent road is a boon to motoring, but concrete is particularly desirable from the standpoint of easy

traction, of safe, comfortable riding, and of road visibility after dark.

Concrete also has the solidity and strength which endure under heavy traffic and make it so universally used in the most important engineering works.

Alternate stretches of improved roads and mud holes do not get the motorist anywhere. He needs a continuous highway just as a locomotive needs a continuous track. Systems of concrete highways are the efficient and economical plan.

*This Association can give you some interesting figures to show how light is the annual tax levy to pay off a good roads bond issue. Our Bulletin No. 136 has some interesting facts about concrete roads. We will be glad to send it to you.*

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## CONCRETE FOR PERMANENCE

## MOTOR DEPARTMENT

(Continued from page 642)

It is this very eagerness of the transformed ignition current which makes it so well suited for use in gasoline ignition, and yet which at the same time is the cause of the almost super-care needed in the construction of spark-plugs.

When this current goes joyfully on its way, it seems almost as though nothing can stop it. Air is generally supposed to be a fairly good insulator or non-conductor of electricity, but the very pressure behind this high voltage induces it to jump air gaps as great as one-quarter or one-half inch in width; and it is the spark thus formed when making this jump that is used to ignite the mixture in practically every automobile and motorcycle engine in service today.

But, when confined within its proper limits in conductors—or metal through which it can pass easily, this fluid goes quietly on its way; therefore in order that it may give vent to its excessive spirits in a manner in which it may be used most effectively for the ignition of the gasoline vapor in the engine cylinder, it is led to the exterior of the spark-plug and there closely confined until it reaches the extreme end in this plug. At the extreme end of the plug are located the points, which might be considered to represent the ends of two heretofore insulated wires.

This high voltage current is human in that it always seeks the "easiest way." Because it has been so closely confined within these wires by means of insulation and within the wire or electrode of the spark-plug by means of heavy porcelain, mica, or stone, it doesn't find an easy way to return to the battery until it reaches the two terminals, or points, at the lower end of the spark-plug extending into the cylinder and at the heart of the explosive charge. The jump which it takes here creates the hot, fat spark without which no automobile-engine can turn of its own accord.

The eagerness of an electric current to flow is caused by its desire to get from one side of the battery, or other form of power producer, to the other side. It cannot do this through the battery itself, but in the case of an automobile-engine the current is sent by a rather involved route through the insulated wire and insulated portion of the spark-plug to the other point on the opposite side of the gap where the jump is made. The connection of the opposite side of the gap is made directly with the engine through the threads of the spark-plug which are screwed into the cylinder-head. The iron of the engine forms the return route by which the current reaches the battery, and this accounts for the fact that only one wire is used with each spark-plug.

When the current reaches the spark gap, it may be returned to the engine by as many routes as is desired through the use of an additional number of points emanating from the opposite side and forming a number of gaps, over all or any of which it may jump, at its discretion.

As already intimated, the very eagerness with which the ignition current hurries to do its work is the cause of no little concern on the part of manufacturers of ignition wires and cables. Through very excess of spirits this high pressure fluid seeks to overflow the proper bounds of its copper wire, and, following the law of the "easiest way" endeavors to reach the engine and thus return to the battery through a shorter route than that offered by the spark-plug. If the current can find such a route, we have a condition known as the "short circuit," and the current will forsake its beaten path through the spark-plug. For this reason the insulation of the wire must be of the best quality, and of thickness which will render it free from "breakdowns" or leakage of the current. Gasoline, oil and grease have a deteriorating effect on such materials, however, and it often happens that wires which have been used for some years will become so soaked with these materials that a short circuit will be formed at the point at which one

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I like it, too, because it is perfectly safe to use day or night—you know Carbona is the one cleaning fluid that—

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wire passes over the iron of the cylinder or other metal part of the engine.

But, assuming that the current has been confined within its proper bounds until it reaches the spark-plug, we cannot consider that it has yet given up the fight for "an easy way home." It would seem that the porcelain, mica or stone, which formed the insulating material of spark-plugs, and which is used to hold the current within the central wire or electrode until it reaches the sparking points at the lower end, would serve the purpose, for we have always been taught that these materials are absolute non-conductors of electricity. And so they are, but the slightest porosity in the insulator, or a crack no larger than a hair, can form the basis for a leak of electricity that will oftentimes baffle the most expert engine tester.

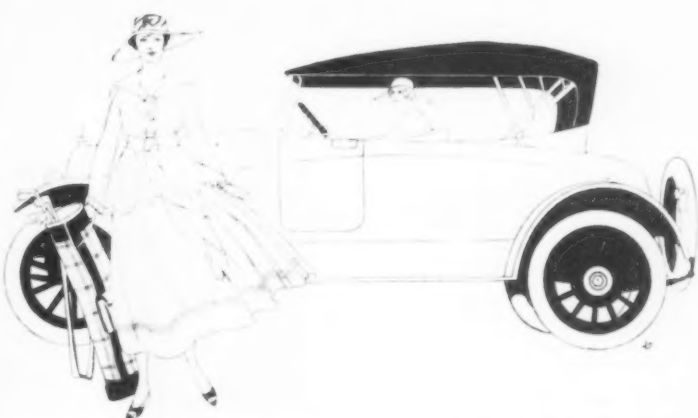
But, as ambitious and active as the ignition current may seem to be when it is given an opportunity to jump in the open air, we must remember that totally different conditions prevail in the engine cylinder. A spark which will easily vault a space of a half-inch or more between a broken portion of the insulation and cylinder head, will be absolutely discouraged if it is expected to jump a third of that distance in the highly-compressed air existing during the time that ignition is supposed to occur. The greater the compression in the engine, the more difficulty does the spark find in bridging the gap, and inasmuch as the compression in an engine cylinder is some four or five times greater than that of the atmosphere, we may realize how important a matter is the proper setting of the spark gap. This should in general be about twenty-five one-thousandths of an inch, but in lieu of a proper gauge, it is generally sufficient to assume as an approximate measure the thickness of a ten-cent piece.

Realizing the discouraging conditions encountered by a spark when it is forced to jump in highly compressed air, it is scarcely to be wondered at when the plug, which would seem to operate perfectly when placed on the top of the cylinder where the spark may be observed in the open air, will fail to render even mediocre service when subjected to the more rigorous conditions existing in the cylinder.

Inasmuch as we have seen that a spark is not formed unless the current is actually forced to jump a gap, we can see that a drop of oil, which is in itself more or less of a conductor, will effectively bridge the space between the sparking point and enable the current to flow across it without creating the fuss resulting in a spark. It is this seemingly harmless drop of oil, which may disappear before we are able to remove the spark-plug from the cylinder, that is the cause of many a mysteriously "missing" cylinder, and trouble from this source should always be expected from a cylinder in which the piston rings are badly worn, so that an excess of oil is allowed to pass by and reach the combustion chamber. Carbon, that material which seems to be so easily distilled in every engine cylinder, will help to bridge the gap which should be taken by the spark. This carbon may not form directly on the sparking point, as the heat here is oftentimes sufficient to burn it entirely off, but it can gradually form around the base of an improperly constructed plug until another "easy way" is built up—hence the necessity for frequent cleaning of spark-plugs. This cleaning, by the way, should extend to the exterior of the porcelain or mica, which projects into the air above the engine, for an accumulation of oil and dirt on the smooth surface of the plug can easily form a short circuit by which the current will travel from the upper terminal of the plug to the iron nut which is screwed into the engine head.

We all know the effect of carbon on the operation of an engine. Not only is the compression increased but the irregularly-formed points soon become incandescent from the heat of explosion, and these serve to ignite the mixture, with the aid of the heat already created by compression, before

(Continued on page 649)



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<input type="checkbox"/> Mining	<input type="checkbox"/> Bookkeeping	<input type="checkbox"/> Poultry
<input type="checkbox"/> Mechanical	<input type="checkbox"/> Stenography	<input type="checkbox"/> French
<input type="checkbox"/> Mechanical Drafting	<input type="checkbox"/> Civil Service	<input type="checkbox"/> German
<input type="checkbox"/> Architectural Drafting	<input type="checkbox"/> Ry. Mail Service	<input type="checkbox"/> Italian
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## JASPER'S HINTS TO MONEY-MAKERS



JUDGE JOHN A. BARHITE

Of Rochester, N. Y., who was recently appointed public service commissioner of the State of New York for a term of five years. He is one of the State's leading lawyers and has served acceptably as special county judge.



EDWIN DENBY

Of Detroit, Mich., ex-president of that city's Board of Commerce and ex-Congressman, who has sacrificed his business and enlisted as a private in the U. S. Marine Corps. He served with the Michigan Naval Reserve in the Spanish-American War.



WILLIAM DENMAN

Chairman of the Federal Shipping Board at Washington, which has asked from Congress an appropriation of \$1,900,000 for the speedy construction of ships in order to overcome the submarine menace.

NOTICE.—Subscribers to LESLIE'S WEEKLY at the home office, 225 Fifth Avenue, New York, are placed on what is known as "Jasper's Preferred List," entitling them to the early delivery of their papers and to answers to inquiries on financial questions and, in emergencies, to answer by telegraph. Preferred subscribers must remit directly to the office of LESLIE'S in New York, and not through any subscription agency. No charge is made for answering questions, and all communications are treated confidentially. A two-cent postage stamp should always be inclosed. All inquiries should be addressed to "Jasper," Financial Editor, LESLIE'S WEEKLY, 225 Fifth Ave., New York. Anonymous communications will not be answered.

THE location of the River of Doubt can no longer be questioned. It is in Wall Street. The dullness of the market and the tendency to liquidation are the natural results of the uncertainty which has prevailed ever since Congress was called to meet.

Brokers do not like a quiet market. They can make no money when business is dull. Speculators likewise want activity and so the market has moved backward and forward due to the transactions of those who speculate from hour to hour and thus make or lose a living.

It is beyond question that with the outbreak of the war far-reaching apprehension was felt that we in this country would be subjected to the same privations as are experienced by all the contending nations. Unfortunately, a cry was heard, especially at Washington, in favor of the strictest economy, but as Mr. S. W. Straus, President of the American Society for Thrift, puts it: "In our efforts to be economical, patriotically, we find ourselves going to extremes in the opposite direction, which is just as great a menace as wastefulness and extravagance. One of the worst calamities that could befall our Nation at any time would be to stop the wheels of industry, but more especially now."

I note that Mr. E. C. Morse, Vice-President of the Chalmers Motor Company, in the same line says: "War in itself does not cause business depression. Billions of dollars have been appropriated by Congress for war preparations. This great sum of money, put into immediate circulation in this country, will create new wealth for use in the world-struggle for humanity. Caution is warranted, but we should buy goods and lead the lives we have been accustomed to. Factories must be kept going to their full capacity. Labor must be kept employed. Our homes must be kept up. We must cheerfully pay war duties in addition to usual peace duties and expenditures." This confirms what I have said in previous articles. And it is sound, logical and conclusive. We will all realize it a little later on.

If we could only get it into the minds of the American public that our situation is entirely different from that of the other nations at war in that we are self-contained and self-supporting, it would go a good ways

toward disarming the sort of semi-panic into which we have been thrown.

We are not going to starve in the United States. Prices of food products will be high because all the world is bidding for our supply, but the higher the prices of what we produce the greater the income of the producers and the more they will have to spend. They will have more money with which to buy clothing, automobiles, motorcycles, dresses and articles included in the list of so-called luxuries.

It must be conceded that men of large means, the heads of our industries and of our railroads, are not satisfied with the outlook at Washington and with the crude attempts to devise a scheme of war taxation adequate to our needs. The war revenue measure recommended by the Ways and Means Committee of the House would kill off a lot of the publishers and cripple many of our great industries.


Everybody should pay his part of the burden of war, but this burden should be levied in such a way as to make it a producer, rather than a destroyer, of business. We should be willing to take the honey from the hives, but we ought not to kill the bees.

The preparation of a scientifically prepared revenue measure is a delicate matter. It cannot be done offhand, nor by slipshod methods. These prevail too often in Congress.

The President has been wise enough to summon to his aid the busiest and brainiest business men, bankers and railway managers to help solve his problems. These should have been called into conference by the Ways and Means Committee. The only chance they have is to appear at the hearings, after the work of the committee has been crudely and hastily done. In the Senate, this work will probably all have to be recast, but until the war revenue bill is signed by the President business will not know where it is at.

Undoubtedly there has been heavy liquidation of first-class securities by men of large wealth who prefer to put their money in the new 3½ per cent. Liberty Loan and thus to escape the heavy super-income taxes which it is proposed to place on incomes of the first magnitude. The sacrifice of these securities has given an opportunity to small investors to pick up good bargains and as these investors have only a moderate income tax to pay they find a profit in securities which are unprofitable to those subject to the highest income tax.


I can see evidences of the purchase by careful investors of the best class of dividend payers on every decline. These are the ones who took their profit when the market was



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## Leslie's at the Government's Service

Leslie's is glad to be one of the many representative industrial organizations to place itself completely at the service of the Government. The following offer has been made by the Leslie-Judge Company to the president, and accepted by him:

"In the present situation, as at every other crisis of the past sixty-two years, the columns of Leslie's Illustrated Weekly Newspaper—editorial, news, pictorial and advertising—are at the call of the United States Government for any public service desired. This offer is both without any charge and without any limit. The same applies to our other two periodicals, Judge and Film Fun. We will feel honored to be given the opportunity to do our part in placing the Government's messages before the people in the six hundred thousand homes reached weekly or monthly by our periodicals."



at its best, and who foresaw the possibility of complications growing out of the war and, with cash in hand, prepared themselves for the bargain counter days.

Those who were not so forehanded, should not be led to sacrifice their securities. The present wave of pessimism is bound to subside and wiser judgment in levying war taxes seems bound to prevail.

P., Kingston, N. Y.: Metropolitan Pet. is said to control large productive property in Mexico, but lacks transportation facilities. The stock will probably continue to be a football for speculators.

B., Weehawken, N. J.: Earnings of the Sumatra Tobacco Co. for the year ending June 30, 1916, were much less than for the previous year, but are rapidly improving. The preferred is a fair purchase and the common a speculation.

Q., Omaha, Neb.: I prefer oil stocks that have made consistent records as dividend payers, such as S. O. of N. J., S. O. of Cal., Vacuum Oil, and Texas Co. Midwest Refining, under \$120, has merit. The cheap stock of a newcomer like Crown Oil is only a speculation.

B., Oak Park, Ill.: Stocks of well-established chemical concerns are desirable but those of new companies in this line are highly speculative, as the competition is very strong. Apparently the great American Chemical Products Co. depends on the public to furnish money for starting business.

C., Elwood, Ind.: Better wait awhile until conditions in the stock market become clearer and more stable. Then buy any of the stocks (especially preferred) or bonds of the standard dividend-paying railroad, industrial or public utility companies. Remember that when everybody is selling is the time to buy. The Liberty Loan is all right.

R., Fargo, N. D.: C., Stockbridge, Mich.: National Rubber Co. of New York is a subsidiary of National Rubber Company, whose plant is at Pottstown, Pa. The parent company manufactures tires, claims to have a large profitable business and pays dividends. The New York Co. is a sales concern and what success it will have in the plan of establishing 1000 stores cannot be foreseen. Its stock is only a speculation.

A., Newburgh, N. Y.: 1. Cresson Consolidated Gold is one of the successful producers of the metal. The stock has had a big advance above par and possibly has discounted its future. 2. Hecla has been a good dividend payer and still yields 15c per share per month. It is selling at about 30 times par and that would seem to be high enough.

3. Carwen Steel lately initiated dividends, 2 per cent. regular with an extra of 1/2 per cent.

H., Columbus, Ohio: I do not consider Cities Service preferred a "first class," but rather a business man's investment. The company is strong and progressing, but its dividend record has been rather erratic, although it has made up for suspensions and arrears. Its recent large increase of stock may account in part for the low quotation of preferred, but market conditions, affecting all other securities, also are largely accountable for this.

S., Elmira, N. Y.: Your neighbors could scarcely have picked up a bunch of more undesirable stocks than those you mention. Eagle Macomber Motor Car Co. has not, so far as I know, reached the dividend-paying stage. Harroun Motors Corp. has been severely criticized by reputable publications. Uncle Sam Oil Co. has been for years selling stock at low prices and is still far from dividends. Amalgamated Oil Co. of Okla. was pronounced unreliable months ago by a newspaper in that state.

Y., Rochester, N. Y.: American Woolen is good. Dela. & Hudson has recovered a portion of its recent decline. President Loeve says: "I see no reason to believe that the dividend is jeopardized, as the coal business will see it through." Wilson & Co., Midvale Steel and U. S. Steel may safely be bought if the market has a sharp decline, following recent liquidation. All these stocks except Wilson & Co. are dividend payers, NAY. C., Dela. & Hudson and U. S. Steel having the longest records.

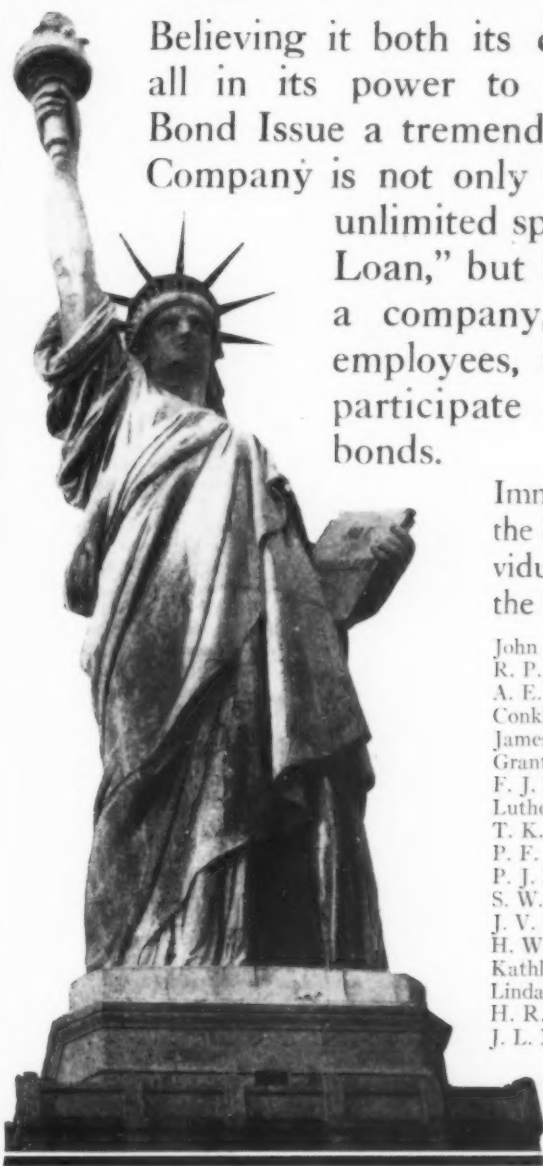
H., Westley, R. I.: Kennecott Copper, Ohio Oil and Vacuum Oil pay dividends and while they are lower than you paid, in common with the rest of the market, it would seem wiser to hold them on prospect of the market's recovering than to sell at a loss. Wright Martin is issuing new common at \$5 per share, and this has been subscribed for by some of the wealthiest men on Wall Street. With large working capital the company will be in better position to take government contracts in sight.

R., Athens, Ga.: 1. Good bonds or high grade preferred stocks of railroads, industrial or public utility companies would be the best. Among the desirable preferred stocks are American Sugar, American Smelting, Atchison, St. Paul, U. S. Steel, National Lead, U. S. Rubber, American Woolen and U. P. The first mortgage bonds of leading railroad and industrial corporations and first mortgage, farm and real estate bonds are also safe investments. 2. International Nickel will flourish while the war lasts and perhaps longer. It is a generous dividend payer and a good speculation.

H., Lykens, Pa.: 1. H. M. Byllesby & Co., Inc., are noted for successful management of public utility companies. The 6 per cent. gold notes of Standard Gas & Elec. Co., and of Western States Gas & Elec. Co., offered by the firm, are considered good business men's investments. 2. Penn. R.R., Union Pac., and Chicago & Northwestern are the best R. R. stocks and are excellent purchases for a business man. For a woman's funds the gilt-edged bonds or preferred stocks of leading and seasoned dividend-paying railroad, industrial and public utility companies would be preferable. You might consider Atchison pfd., U. S. Steel pfd., National

(Continued on page 649)

# "THE LIBERTY LOAN"



Believing it both its duty and its privilege to do all in its power to make the new Government Bond Issue a tremendous success, the Leslie-Judge Company is not only donating to the Government unlimited space to advertise the "Liberty Loan," but has arranged to subscribe as a company, and also have all of its employees, in all parts of the country, participate as individual purchasers of bonds.

Immediately upon the announcement of the Loan, subscriptions were entered, individually, by the following executives of the Company:

John A. Sleicher, President  
R. P. Sleicher, Secretary and General Manager  
A. E. Rollauer, Treasurer  
Conklin Mann, Managing Editor of Leslie's  
James A. Waldron, Editor of Judge  
Grant E. Hamilton, Art Director  
F. J. Splitstone, Circulation Manager  
Luther D. Fernald, Advertising Manager  
T. K. McIlroy, Eastern Advertising Manager  
P. F. Buckley, Western Advertising Manager  
P. J. Ryan, Manager, St. Louis Branch  
S. W. Magee, Manager, Chicago Branch  
J. V. Murray, Manager, New York Branch  
H. W. Slauson, Motor Department Editor of Leslie's  
Kathleen Hills, Travel Department Editor of Leslie's  
Linda M. Griffith, Contributing Editor, Film Fun  
H. R. Baukhage, Manager Service Department  
J. L. Niederherst, Manager, Omaha Branch

E. D. R. Browne, Bank Sales Manager  
N. L. Preston, Manager, Newark Branch  
and subscriptions are pouring in daily from members of our organization at the home office and our 23 branch offices throughout the country.

## To Employers

We shall be glad to offer our services to any employer desiring to make similar arrangements, explaining in detail the methods we have followed, in making it possible for every patriotic wage-earner to do his part in helping the Government raise the money it needs to carry on the war.

## To Individual Investors

"Every investor, even the smallest, would naturally want some proportion of his funds in such a security as this, and it would be a healthful outcome if millions of people who have never before attempted investment could be led to lay a foundation by taking on some amount, however small, of these prime securities," says the *Bache Review*.

More than seven million citizens of Great Britain subscribed to the latest British war loan—the most convincing proof to the world that all the people of the British empire were back of the Government to win the war. The people of the United States—the richest nation in the world—can easily be represented by millions of individual subscribers.

Every man, woman and child should buy a "Liberty Loan" Bond—even if the amount subscribed is as little as \$50. As a matter of fact the Government is going to give preference to small subscriptions, giving the smallest investors the best chance, in order to insure as large a number of subscribers as possible.

You can subscribe through any bank or investment house. But if you have the slightest difficulty in doing so, write to Jasper, Financial Editor of Leslie's, and he will advise you.

**Don't delay—get your subscription into the hands of the Government immediately**

## WHEELS UNDER TWENTY ARMIES

(Continued from page 643)

force the railroads must carry, beside the 1,640,000 men, 700,000 mounts and draught animals, 60,000 vehicles, and 3,360 big guns.

To accomplish this the quartermaster corps must have available at the right points 42,300 passenger coaches, 7700 baggage cars, 21,100 box cars, 37,980 stock cars and 15,500 flat cars, making a total of 124,580 cars, or 7,320 trains with as many engines. It will be seen that with engines and freight cars we are amply provided, only a small percentage of our total available number being needed for this task. However, it must be remembered that our civil traffic cannot be interfered with unduly and that we have barely enough rolling-stock to handle it in peace-times. As for passenger-coaches, we can meet the requirement only by waiving army regulations, which require tourist sleepers for the transportation of troops. Of this type of car we have in the country barely enough to carry 30,000 men.

But having mobilized the troops, assuming even that they would remain for the most part in the positions where they were first detained excepting as they were shifted behind the lines by the military railroads, the task of the commercial roads has just begun. The troops must be provided with supplies. Here is the government's minimum estimate of the gross weight of materials needed each month by this force of 1,640,000 men: Rations, 250,630,460 lbs.; ammunition, 7,046,160 lbs.; forage, 623,147,600 lbs.; general quartermasters' supplies, 33,794,440 lbs.; clothing, and equipage, 22,680,340 lbs.; ordnance supplies, other than ammunition, 1,622,740 lbs.; engineers' supplies, 12,208,320 lbs.; signal supplies, 9,043,200 lbs.; medical supplies, 597,160 lbs.; candy and tobacco, 319,680 lbs.; making a total of 961,089,100 or nearly one billion pounds. The transportation of this enormous weight would require 55 trains of 30 cars each day as long as the force was in the field.

In view of all these complicated details it will be readily seen that not only is individual knowledge and efficiency on the part of quartermaster corps officers highly necessary, but one of the most important measures of preparedness is the coordination of the numerous railroad systems of the country so that they will work as one system for military purposes. This does not mean government ownership as in Germany nor government leasing as in England. The quartermaster corps has all it can handle in carrying out its present part. To do this efficiently the department is enlisting into its service some of the best brains in our railroad offices.

In addition to this is needed the complete, systematic cooperation of the present railway administrative machinery, the whole under federal control. To further this end the railroads through their executive officers have offered their cooperation. A special defense committee of five railroad presidents has been organized with Fairfax Harrison, of the Southern Railway, as chairman and including also Howard Eliott, former president of the New York, New Haven and Hartford; Julius Kruttschnitt, of the Southern Pacific; Hale Holden of the Chicago, Burlington and Quincy; and Samuel Rea of the Pennsylvania. Under this central committee are six sub-committees corresponding to the six army departments of the country.

The plan on which this committee will cooperate with both the army and navy has been developed by Lieutenant Colonel Chauncey B. Baker, of the Quartermaster Corps. Under this arrangement men from the American Railway Association, representing the operating, motive power, traffic and accounting departments of the railroads, are detailed for duty in Army Headquarters. Others will be stationed at mobilization camps, at concentration points and at other places which the war department considers to be of strategic importance.

The selection of these men has been left largely to the various roads, subject to the approval of the defense committee and under its general ruling that all must be "chosen from a class of broad-minded men, temperamentally of such character as would take a broad view of transportation in movements of troops and supplies. They will assist the quartermaster with whom they serve, not only in the transportation of troops but in any other transportation matter in which their assistance may be requested."

So far as possible the assignments will be permanent, to the end that federal and state officers may be able at any time to communicate with transportation experts and arrange in advance all special details.

In the instructions issued to the transportation experts assigned to work with the quartermaster corps, the principle is laid down that once so employed each man ceases to be the representative of the company from which he comes and must not in any way shape matters for the benefit of any individual road.

In addition to this scheme for service, the committee has ordered a tabulation of rolling stock available for military purposes, particular attention being paid to the larger types of freight cars that will be needed for the movement of heavy artillery, that they may be mobilized with the smallest loss of time. There is at present only one car in the country capable of carrying a 16-inch gun. A survey is also being made of the facilities of the various railroad shops which may be utilized for repair work at considerable saving of time.

Beside more heavy cars, we need special terminal yards and sidings, loading and unloading platforms, double-tracking of many single-track lines, and the building of new lines into undeveloped territory. This will take a long time and much capital.

To secure this money in sufficient amounts it is necessary to restore the confidence of investors in railroad securities. Railroad men are coming to see that the straightest road toward that restored confidence lies in the direction of systematized and unified federal control over interstate traffic. The practical necessity of such control as a war measure has been accepted. In carrying it out, however, it may be necessary, temporarily at least, to over-ride some of the conflicting regulations of the forty-eight states which in past years have been allowed to exercise extensive authority over roads running through their territory.

It has for some time been maintained by railroad economists that one of the chief reasons for the fact that the development of American roads has not kept up to the demands of the country's growing business, and that the roads as a consequence are at the same time not on their most efficient war basis, is that for a decade the railways have been beset by this conflicting and expensive state legislation beside the regulation of the national government. They hope, therefore, that the lesson learned in the process of military-railway preparedness will lead to a reorganization of the Interstate Commerce Commission and the placing with it exclusively, as far as interstate railroads are concerned, of the functions now so variously exercised by state legislatures and commissions. By the permanent adoption of this policy it is hoped that a future national crisis will not find the railroads unprepared.

From the railroad angle it is probable that while temporary conditions may cause considerable hardship both to the roads and to the general public the fact that government officials have at last come face to face with railroad problems will breed an appreciation of the gravity of the situation into which past legislation has forced the roads.



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## JASPER'S HINTS TO MONEY-MAKERS

(Continued from page 647)

Lead pfd., American Smelting pfd., U. S. Rubber first pfd., Baltimore & Ohio pfd., American Woolen pfd., Kansas City & So. pfd., or U. P. pfd.  
New York, May 17, 1917. JASPER

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Readers who are interested in investments, and who desire to secure booklets, circulars of information, daily and weekly market letters and information in reference to particular investments in stock, bonds or mortgages, will find many helpful suggestions in the announcements by our advertisers, offering to send, without charge, information compiled with care and often at much expense. A digest of some special circulars of timely interest, offered without charge or obligation to readers of Leslie's, follows:

Georgia farm mortgages paying 5½ to 6 per cent. are offered by the Sessions Loan & Trust Co., Drawer 5, Marietta, Ga. Write to this company for details.

U. S. Government \$100 bonds may be bought outright or on the small payment plan of E. F. Combs & Co., the \$100 bond house, Equitable Bldg., New York. Send to this company for particulars.

Bonds accepted by the government as security for postal savings bank deposits, free from income tax and paying 4 to 5½ per cent. are dealt in by the First National Bank, Dept. 5, Columbus, Ohio. Ask the bank to send you its free booklet "Bonds of Our Country."

The widely circulated "Bache Review" interprets intelligently the effect of events on security values and gives valuable suggestions for investment. Copies may be had on application to J. S. Bache & Co., members of New York Stock Exchange, 42 Broadway, New York.

Conservative investors are buying government bonds because of their absolute safety. C. F. Childs & Co., 120 Broadway, N. Y., and 208 So. LaSalle St., Chicago, specialize in government issues and are sending out an interesting free pamphlet on these securities. This may be had by applying for Circular L.

Uncle Sam's postal service can bring the best of banking facilities to one's very door. The strong Citizens' Savings & Trust Company, Cleveland, Ohio, invites deposits by letter and will pay 4 per cent. compound interest on them. Write to the company for its free Booklet L, explaining its banking by mail methods.

Facts and figures compiled by reliable brokers are often of great use to investors. Persons interested in copper, Standard Oil and motor stocks will find the Statistical Books on these issues prepared by I. R. Latrobe & Co., 111 Broadway, New York, very helpful. They are sent free on request. This firm deals on the partial payment plan.

The farm mortgage ranks as one of the safest of securities, especially when the farm is situated in a prosperous state. Markham & May Co., 1222 First National Bank Bldg., Milwaukee, make a specialty of dairy farm mortgages in their part of the country. They have issued an interesting pamphlet "The Dairy Farm Mortgage," which will be mailed gratis to any applicant.

While the careful investor insists on buying a safe security he still desires a good yield. The Salt Lake Security & Trust Co., Salt Lake City, Utah, recommends to such investors its 6 per cent. secured certificates based on property having a value much above the face of the certificates. The company will send without charge to any address its booklet and detailed information.

Investors and business men anxious to secure accurate information and safe advice should consult the Babson Service, which helps one to follow and to guard against sudden market changes. Particulars regarding this service can be had free by all who write to Dept. L-45 State Babson Statistical Organization, Wellesley Hills, Mass., the largest organization of its kind in the world.

A very important information service is offered to investors by the National City Co., National City Bank Bldg., New York. This service covers appraisal of values, status of bonds under the income tax law, the legality of bonds and the adaptability of bonds to specific requirements. There is no better source of information on these matters.

The company invites correspondence from investors. Thousands of patriotic Americans who cannot go to the fighting line can effectively aid their country by purchasing a government bond. The \$100 bonds of the widely known bond house, S. W. Straus & Co., 150 Broadway, New York, and Straus Bldg., Chicago, are a long step toward it.

Thousands of persons of moderate means. John Muir & Co., specialists in odd lots and members of New York Stock Exchange, 61 Broadway, New York, specialize in \$100 bonds. They will send free to any applicant an interesting circular on this subject.

Safety is a quality in investments especially sought for at this time. For 35 years securities safeguarded by the Straus plan have been sold without loss to any investor. Full information regarding these first mortgage real estate bonds, netting 5½ to 6 per cent., and secured by high-grade property, may be found in circular No. 1-703, to be had free of the widely known bond house, S. W. Straus & Co., 150 Broadway, New York, and Straus Bldg., Chicago.

The National Thrift Bond Corporation, 61 Broadway, New York City, recently organized to market bonds in denominations as low as \$10, will accept Thrift bonds at their face value in exchange for Liberty Loan bonds without charge to holders except for transportation, premium and accrued interest. The corporation will purchase for transfer to trustee of Thrift bonds only government issues until the 3½ per cent. command a premium. Write to the corporation for details.

President Wilson recently said, "Upon the farmers of this country rests the fate of the war and the fate of the nation." An investment in sound farm mortgage loans not only provides safety of principal and a satisfactory income, but also helps along the nation's food production. Write to the American Trust Company, Investment Department, Broadway and Levee St., St. Louis, Missouri, for book No. 154, describing 5½ per cent. farm mortgage bonds in denominations of \$100 and upward.

Shipping and shipbuilding are likely to flourish long after the war. The Tillotson & Wolcott Co., investment bankers, Cleveland, Ohio, and 115 Broadway, New York, are distributing the \$600,000 first mortgage 6 per cent. gold bonds of the Canada West Coast Navigation Co., Ltd. This issue is secured by a subsidy from the government of British Columbia. The subsidy assures a net income for 10 years following the war sufficient for interest and to pay portions of the principal. Complete details may be had on application to the Tillotson & Wolcott Co.

## MOTOR DEPARTMENT

(Continued from page 645)

the proper firing point has been reached. The result is a violent downward thrust on the piston, before it has reached the top of its stroke, and this thus causes the pronounced knock in an engine cylinder as the piston is slapped against the side wall.

In certain engines, a spark-plug of the wrong design may produce this same effect. If the electrodes, or sparking points, are made heavy or of such size that they cannot dispose of sufficient heat between explosions, these points will become red hot and will fire the mixture before ignition should occur. Therefore, regardless of the excessive heat to which these firing points are subjected, their size must be limited to that which will radiate this heat with sufficient rapidity to keep the temperature below the firing point; it is quality of material rather than quantity which is most important in this feature of spark-plug construction.

In selecting spark-plugs it is well to know the type which the manufacturer of your engine recommends. In addition to the three different sizes, there are a variety of shapes and constructions; for example, the engine having its spark-plug opening set in a depression, will require a plug with a low thread and a high nut in order that the sparking point will not project too far into the cylinder and be damaged by the piston or valves as they move upward. The engine having a greater thickness of wall or head through which the spark-plug must be passed, should use a plug with a projection beyond the threads, so that the sparking points may extend a sufficient distance into the combustion chamber to insure the proper ignition.

There are many other considerations to be observed in selecting spark-plugs, but we would, above all, urge the car owner not to condemn a plug off-hand because the cylinder in which it is located is "missing." First, be sure that there is the proper sparking current sent to the offending plug; timer distributor or battery troubles may prevent this, and the plug should, in all fairness, not be blamed for the failure of other parts of the ignition system.

### QUESTIONS OF GENERAL INTEREST

#### REAR AXLE TRANSMISSION

E. S. D.: "What is the advantage of placing the transmission at the rear axle?"

Some manufacturers have adopted this design because of production advantages. The sound of the gears in first and second speed is less noticeable when the gears are placed in this position. Furthermore, it is evident that the driving shaft always revolves at engine speed, whereas if the transmission is located forward, the speed of the driving shaft is multiplied by the gear ratio which is in mesh. However, driving shafts are nowadays made so accurately that they are not affected materially by their increased speed of revolution under these conditions.

#### EFFECT OF SPEED ON TRUCK TIRES

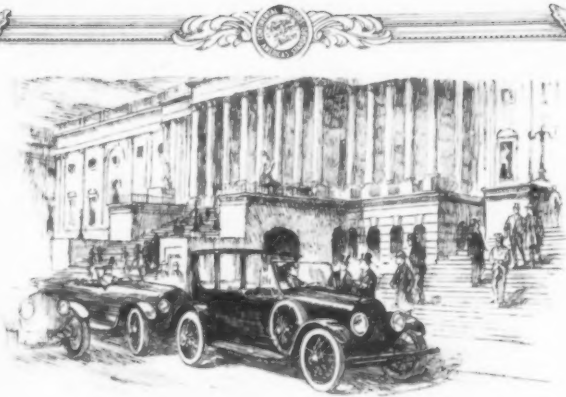
B. T. S.: "I understand that overspeeding a motor truck affects the mechanism as well as the tires out of all proportion to the increase in speed. Can you tell me what ratio applies in this case?"

A prominent tire manufacturer is the authority for the statement that doubling the speed makes the force of road shocks communicated to the engine and load just four times as great.

#### SQUEAKING BRAKES

F. L. O.: "Occasionally I find that one of the brakes on my rear wheel squeaks, although it seems to grip well. The lining is not unduly worn, and I am afraid to adjust the brake tighter for fear of overheating. What would you suggest?"

A few drops of castor oil applied to the brake drum of the offending wheel will soon remedy matters. You should be careful, however, to test out your brake, for too much oil will prevent the brake from gripping properly and may result in an accident in traffic if you are not prepared for the changed braking conditions.



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## WATCHING THE NATION'S BUSINESS

BY THOMAS F. LOGAN

LESLIE'S WEEKLY BUREAU, WASHINGTON, D. C.

### DISCRIMINATORY TAXATION

WITH the cost of printing material increased a hundred per cent. since the war began, the imposition of additional postage charges on second-class matter will put many magazines and newspapers out of business. Particularly objectionable is the proposed adjustment of rates by parcel post zones. This will have the effect of restricting circulation at a time when publicity should be more general than ever before. The newspapers and magazines have been the great supporters of the government. Under the provisions of the excess profits tax it is pointed out that there will be a duplication of taxation. With a "super" tax on incomes above a given amount, those derived from corporate earnings will have been subjected to an excess profits tax in well-managed industries, while the same earnings will be again taxed in the form of an income. Discrimination comes in where similar incomes are derived from corporations which, through inefficient management or for other causes, fail to return a profit on the investment great enough to come within the scope of the excess profits tax provision. This feature justifies the charge made in Congress that the whole scheme is "unjust, inequitable, and a tax on the thrift and efficiency of the nation." It is particularly objectionable as being calculated to check enterprise. That the Senate will respond to the general dissatisfaction is indicated by the fact that it is framing a substitute bill. Unless taxation is pursued along lines that will distribute the burden over all classes and sections, the measure adopted will be neither just nor patriotic.

### LOYALTY OF BUSINESS

IN its hour of need the Government has found a strong right arm in the willingness and preparedness of the great industries of the country to cooperate in the great task ahead. Now that war is on, the heads of the country's industries have been called in by the Government to help solve the innumerable problems that exist. The division on the production of raw materials, which is a branch of the National Defense Council, does not hesitate to accept their services. In all branches of industry capable leaders of the highest business caliber have been drafted into the work, although it would be more proper to say that they volunteered before the call. The immediate result has been to render unnecessary any commandeering, such as was thought might be necessary. These men not only serve without pay, but they have offered their products to the Government at less than the current market prices. As it is only a matter of time until special departments of munitions, transportation, ship construction and food control must be established, the early enlistment of these men in the cause will greatly simplify the solution of the gigantic task that will follow.

### THE CRY OF THE RAILROADS

WHEN the Interstate Commerce Commission opened its hearings on the request of the railroads for a 15 per cent. increase in freight rates all along the line, it found the common carriers ready with a formidable array of figures. Spokesmen for the eastern railroads showed that, with the advance allowed, they would still be short \$75,000,000 of the \$217,000,000 increase in operating expenses for 1917 over those for the preceding year. This estimate of discrepancy is based on current costs of labor and material, neither of which will become cheaper while the war is in progress. On the other hand, the tendency will be toward higher prices. An idea of the character of increases is obtainable from the estimates submitted by the Pennsylvania system, as follows: Fuel, \$15,000,000; material, \$14,694,000;

wages under the Adamson Law, \$10,757,000; wage adjustments for employees other than trainmen, \$10,842,000, and Federal taxes, \$50,000. This total of \$59,892,000 in increased expenses for the Pennsylvania system will only be partly offset under the requested rate advance, leaving a balance on the wrong side of the ledger that will make the road \$12,000,000 worse off in 1917 than in 1916. Similar testimony was presented by the representatives of the other large eastern systems. In advancing their arguments the spokesmen for the railroads laid stress on the necessity for increases in order that the railroads might do their part toward the winning of the war, as well as to meet the enormous increases in operating expenses.

### REBUILDING FRANCE

REALIZING that the slow retreat of the Germans from northern France is a permanent withdrawal, many prominent Americans, in cooperation with officials of the French government, have established the French Reconstruction Fund. It is expected that the activities of these Americans within the next year will raise large sums with which to repair the wanton destruction by the Hun of the fairest provinces of our sister republic. It is the plan of the American committee to launch a nation-wide campaign to bring in funds which will serve to give homes to the weary poilus when they finally return from the trenches, and to provide schools and other institutions for their children. The American committee is composed of such prominent men as William Howard Taft, Cardinal Gibbons and President emeritus Eliot of Harvard. Co-operating with this committee are the following distinguished Frenchmen: Emile Poincaré, President of France; Auguste Rodin, the greatest living sculptor; M. Dalinier, Minister of Fine Arts; Baron Edmond Rothschild, Prince Roland Bonaparte and others. All funds raised in America will be placed in the Pacific National Bank of New York and despatched to France through J. P. Morgan & Company. The process of rehabilitating northern France by means of the money raised in this country will be determined by President Poincaré and his collaborators of the French committee.

### NO COAL SHORTAGE

IN its report on the anthracite situation in the country, the Federal Trade Commission announces the symptoms of a "buying panic," such as was largely responsible for unwarranted high prices in the winter of 1916-1917, and warns the purchasing public against giving away again to hysteria. The commission found that there was no indication of a shortage ahead, nor was there any valid reason why prices should be raised by middlemen or retailers. The commission promises to watch manipulators closely this summer, and asks the support of the purchasers in keeping prices within bounds by means of normal purchases spread throughout the season. It is known, however, that there is difficulty being experienced at the mines by slackness among the workers. With higher wages, many of the men earn enough in three days to support them seven, and prefer to remain idle the remaining four, during which they are consumers but not purchasers. With possibilities of a severe shortage from this irregular work, it has been suggested that the Federal Government require the miners, aliens as well as Americans, to work the full six days a week, or transfer them to other work under government control. This would tend to keep coal prices down. As President Wilson is on record as holding that the entire nation is enlisted for the war, it is probable that, eventually, no branch of industry will be left to the choice of its employees as to how, and at what rate, its activities shall be carried on.



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